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DEPARTMENT OF NATURAL RESOURCES
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Information Circular No. 52

ANALYSES OF OHIO COALS, 1979-1980

by
George Botoman
and
David A. Stith

Columbus
1986

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ABSTRACT

Standard coal analyses and 72 major, minor, and trace element analyses are reported for 169 coal samples collected in 1979 and 1980.

INTRODUCTION

Since 1975, the Ohio Department of Natural Resources, Division of Geological Survey has been participating with the U.S. Geological Survey in an informal cooperative program to expand the available information on the geochemistry of Ohio coals. This report, the third in a series presenting the results of this program (Botoman and Stith, 1979, 1981), covers samples collected from active strip mines in 1979 and 1980. The samples were collected by personnel of the Division of Geological Survey and were shipped to the U.S. Geological Survey, whose personnel prepared splits of the samples for the various analytical procedures involved. Major, minor, and trace element analyses were done by the Branch of Analytical Chemistry, U.S. Geological Survey. Standard coal analyses of the 1979 samples (1128-1250) were done by the Coal Analysis Section, U.S. Department of Energy.

ANALYTICAL METHODS

The analytical procedure followed for these samples is shown in figure 1. Although the U.S. Geological Survey constantly upgrades and revises its analytical program, differences between this procedure and the one followed for the 1977 and 1978 samples (Botoman and Stith, 1981) are minor. Na has been switched back from neutron activation to atomic absorption analysis. Ta, Tl, and W are now done by neutron activation analysis of the whole coal rather than by emission spectrographic analysis of the ash. The U.S. Geological Survey submitted the 1979 samples to the U.S. Department of Energy for standard coal analyses. Because of a change in the U.S. Geological Survey program, the 1980 samples (1253-1263, 1268, and 1363-1378) were submitted to a commercial testing lab. The same standard U.S. Bureau of Mines methods (Office of Coal Research, 1967) or comparable ASTM methods were used by this lab.

ACKNOWLEDGMENTS

Appreciation is expressed to the owners and operators whose mines were sampled in this program and to Linda Bragg, Jack H. Medlin, Charles Oman, and Fred Simon, Branch of Coal Resources, U.S. Geological Survey, Reston, Virginia. Special thanks go to the chemists and analysts of the Branch of Analytical Chemistry, U.S. Geological Survey, Reston; and of the Coal Analysis Section, U.S. Department of Energy, Pittsburgh, Pennsylvania.

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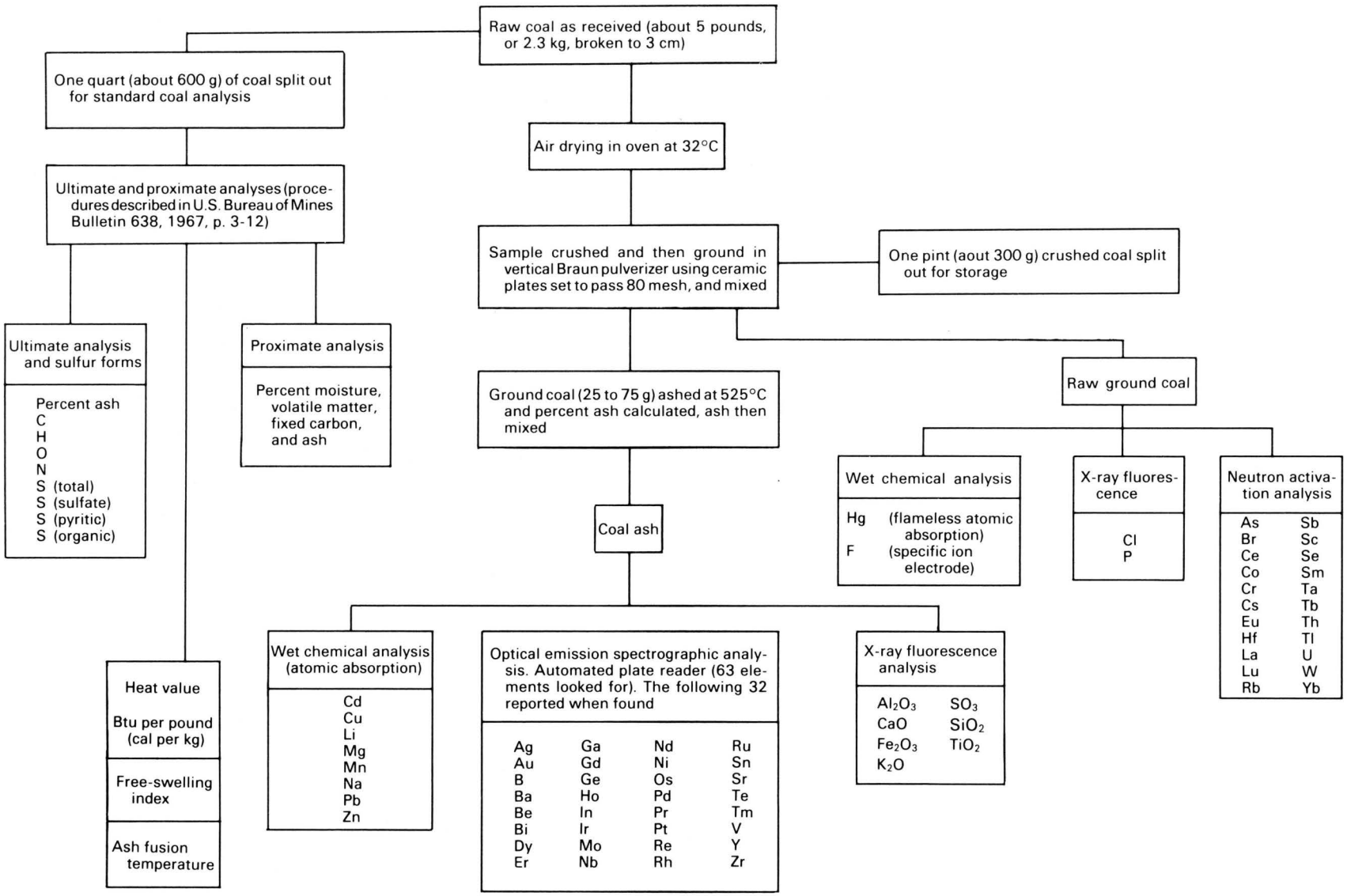

FIGURE 1.—Flow chart showing sequence of sample preparation and chemical analysis (Charles Oman, verbal commun., 1985)

TABLE 1.—*Proximate-ultimate coal analyses by county*

Key to symbols by column:
DGS file no.:
4-digit number - production bench or whole-bed channel sample; taken in conformity with Holmes, 1911; Fieldner and Selvig, 1938
-1, -2 - samples taken in benches or from roof or floor coal

Condition:
2 - as received
3 - moisture-free
4 - moisture- and ash-free

Analyzed thickness (these footnotes apply only to table 1):
[1] - lower bench
[2] - upper bench
[3] - lower bench, good coal
[4] - upper bench, poor coal
[5] - 1137 - lower bench, 1138 - upper bench at same site

1979 analyses from U.S. Department of Energy; 1980 analyses from a commercial testing laboratory.

Township	Seam	DGS file no.	Condition	Analyzed thickness (nearest in)	Air-dried loss (%)	Proximate analysis (%)				Ultimate analysis (%)					Forms of sulfur (%)			Free-swelling index	Fusibility of ash (°F)			Heating value (Btu/lb)	Year
						Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Total sulfur	Sulfate	Pyritic	Organic		Initial deformation temperature	Softening temperature	Fluid temperature		
CARROLL COUNTY																							
Brown	Middle Kittanning (No. 6)	1247	2	28	1.3	3.1	38.0	49.7	9.2	5.4	71.0	1.7	10.0	2.6	0.01	1.64	0.98	4.0	2410	2520	2630	12,800	80
			3				39.2	51.3	9.5	5.2	73.3	1.8	7.5	2.7	0.01	1.69	1.01					13,210	
			4				43.3	56.7		5.8	81.0	1.9	8.3	3.0	0.01	1.87	1.12					14,600	
East	Mahoning	1378	2	16	1.5	4.7	34.7	51.8	8.8	5.0	70.0	1.7	12.8	1.8	0.19	1.28	0.37	1.5	1970	2100	2260	12,390	80
			3				36.4	54.4	9.2	4.7	73.4	1.8	9.0	1.9	0.20	1.34	0.39					13,000	
			4				40.1	59.9		5.1	80.8	2.0	9.9	2.1	0.22	1.48	0.43					14,320	
Lee	Harlem	1244	2	18	1.3	3.3	35.7	51.2	9.8	5.2	70.8	1.9	10.7	1.6	0.01	1.22	0.33	4.0	2140	2270	2390	12,710	79
			3				36.9	52.9	10.1	5.0	73.2	2.0	8.0	1.7	0.01	1.26	0.34					13,140	
			4				41.1	58.9		5.6	81.5	2.2	8.9	1.8	0.01	1.40	0.38					14,630	
	Ames	1242	2	15	1.5	2.8	43.1	37.8	16.3	5.2	63.5	1.7	7.1	6.2	0.01	4.55	1.66	3.5	1940	2010	2090	11,890	79
			3				44.3	38.9	16.8	5.0	65.3	1.7	4.7	6.4	0.01	4.68	1.71					12,240	
			4				53.3	46.7		6.0	78.5	2.1	5.7	7.7	0.01	5.62	2.05					14,700	
Perry	Harlem	1241	2	26	2.1	3.7	33.6	51.1	11.6	5.2	69.6	1.8	11.2	0.5	0.02	0.07	0.46	4.5	2640	2710	2780	12,380	79
			3				34.9	53.1	12.0	5.0	72.3	1.9	8.2	0.5	0.02	0.07	0.48					12,860	
			4				39.7	60.3		5.7	82.2	2.1	9.3	0.6	0.02	0.08	0.54					14,620	
Rose	Lower Kittanning (No. 5)	1246	2	29	1.0	2.9	40.4	45.6	11.1	5.4	68.8	1.7	9.4	3.5	0.01	2.21	1.33	4.0	2320	2430	2520	12,570	79
			3				41.6	47.0	11.4	5.2	70.9	1.8	7.0	3.6	0.01	2.28	1.37					12,940	
			4				47.0	53.0		5.9	80.0	2.0	7.9	4.1	0.01	2.57	1.55					14,610	
	Middle Kittanning (No. 6)	1233	2	48	0.8	2.6	43.4	45.4	8.6	5.5	70.4	1.7	9.3	4.6	0.01	2.59	1.96	4.5	1910	2000	2080	12,890	79
			3				44.6	46.6	8.8	5.4	72.3	1.7	7.2	4.7	0.01	2.66	2.01					13,240	
			4				48.9	51.1		5.9	79.3	1.9	7.9	5.2	0.01	2.92	2.21					14,520	
		1236	2	36	1.3	3.5	39.7	51.5	5.3	5.5	73.6	1.9	11.4	2.3	0.02	0.73	1.55	5.0	2480	2570	2660	13,200	79
			3				41.1	53.4	5.5	5.3	76.3	2.0	8.6	2.4	0.02	0.76	1.61					13,670	
			4				43.5	56.5		5.6	80.7	2.1	9.1	2.5	0.02	0.80	1.70					14,470	
	Lower Freeport (No. 6A)	1234	2	27	0.4	2.3	44.1	42.2	11.4	5.5	68.1	1.9	9.2	3.9	0.02	3.03	0.87	3.5	1980	2090	2170	12,580	79
			3				45.1	43.2	11.7	5.4	69.7	1.9	7.3	4.0	0.02	3.10	0.89					12,880	
			4				51.1	48.9		6.1	78.9	2.2	8.3	4.5	0.02	3.51	1.01					14,580	
	Upper Freeport (No. 7)	1235	2	15[1]	0.4	2.3	33.7	40.9	23.1	4.6	58.2	1.6	9.5	3.1	0.01	1.94	1.14	1.5	2450	2540	2610	10,440	79
			3				34.5	41.9	23.6	4.4	59.6	1.6	7.6	3.2	0.01	1.99	1.17					10,690	
			4				45.2	54.8		5.8	78.0	2.1	10.0	4.2	0.01	2.60	1.53					14,000	
		1235-1	2	12[2]	0.6	2.5	30.7	39.3	27.5	4.3	54.7	1.4	9.8	2.2	0.02	1.37	0.86	0.0	2390	2480	2560	9,710	79
			3				31.5	40.3	28.2	4.1	56.1	1.4	7.8	2.3	0.02	1.41	0.88					9,960	
			4				43.9	56.1		5.7	78.1	2.0	10.8	3.1	0.03	1.96	1.23					13,870	
COLUMBIANA COUNTY																							
Hanover	Upper Freeport (No. 7)	1377	2	30	0.8	3.2	36.6	50.7	9.5	5.0	69.5	1.6	10.0	4.3	0.12	3.09	1.11	4.5	2010	2070	2170	12,590	80
			3				37.8	52.3	9.9	4.8	71.8	1.7	7.4	4.5	0.12	3.19	1.15					13,000	
			4				41.9	58.1		5.3	79.6	1.9	8.2	5.0	0.14	3.54	1.27					14,430	
	Mahoning	1376	2	17	1.0	3.2	33.1	52.8	10.8	5.1	69.5	1.6	11.0	1.9	0.22	1.43	0.28	3.5	2220	2320	2460	12,470	80
			3				34.2	54.6	11.2	4.9	71.9	1.7	8.4	2.0	0.23	1.48	0.29					12,890	
			4				38.5	61.5		5.5	80.9	1.9	9.4	2.2	0.26	1.66	0.33					14,500	
COSHOCTON COUNTY																							
Adams	Lower Kittanning (No. 5)	1255	2	30	3.8	5.2	37.1	52.3	5.5	5.4	70.1	1.4	16.0	1.7	0.03	0.14	1.53	1.5	2630	2730	2800	12,430	80
			3				39.1	55.1	5.8	5.1	73.9	1.5	12.0	1.8	0.03	0.15	1.61					13,110	
			4				41.5	58.5		5.4	78.4	1.6	12.7	1.9	0.03	0.16	1.71					13,910	
		1262	2	25	2.6	3.7	33.2	43.5	19.6	4.6	58.6	1.2	11.4	4.6	0.25	2.93	1.45	1.5	2150	2260	2420	10,630	80
			3				34.5	45.1	20.4	4.3	60.8	1.3	8.4	4.8	0.26	3.04	1.51					11,040	
			4				43.3	56.7		5.4	76.4	1.6	10.5	6.0	0.33	3.82	1.89					13,860	

	Middle Kittanning (No. 6)	1256	2	25	5.6	16.1	39.4	33.6	10.9	4.6	52.3	1.2	29.9	1.0	0.01	0.03	0.99	0.0	2240	2330	2370	8,430	80
			3				47.0	40.0	13.0	3.4	62.4	1.4	18.6	1.2	0.01	0.04	1.18					10,040	
			4				54.0	46.0		3.9	71.7	1.6	21.4	1.4	0.01	0.04	1.36					11,550	
		1263	2	17	2.5	3.5	35.8	49.7	11.1	5.1	67.7	1.4	11.3	3.4	0.28	1.90	1.25	5.5	2110	2200	2320	12,230	80
			3				37.1	51.5	11.5	4.9	70.1	1.5	8.5	3.6	0.29	1.97	1.30					12,670	
			4				41.9	58.1		5.5	79.2	1.7	9.6	4.0	0.33	2.22	1.46					14,310	
Bedford		1167	2	28	3.6	6.7	42.7	47.4	3.2	5.9	70.5	1.4	16.5	2.4	0.01	1.16	1.27	4.0	2050	2140	2220	12,930	79
			3				45.8	50.8	3.4	5.5	75.6	1.5	11.3	2.6	0.01	1.24	1.36					13,860	
			4				47.4	52.6		5.7	78.2	1.6	11.7	2.7	0.01	1.29	1.41					14,350	
Franklin		1159	2	47	2.6	5.3	42.0	45.9	6.8	5.9	69.3	1.4	12.7	3.9	0.01	2.54	1.36	3.0	2130	2250	2350	12,650	79
			3				44.4	48.5	7.2	5.6	73.2	1.5	8.4	4.1	0.01	2.68	1.44					13,350	
			4				47.8	52.2		6.0	78.8	1.6	9.1	4.4	0.01	2.89	1.55					14,390	
Keene	Lower Kittanning (No. 5)	1161	2	39	2.7	5.5	39.0	44.1	11.4	5.5	64.2	1.3	13.2	4.3	0.01	2.86	1.46	3.5	2140	2270	2350	11,770	79
			3				41.3	46.7	12.1	5.2	67.9	1.4	8.8	4.6	0.01	3.03	1.54					12,450	
			4				46.9	53.1		5.9	77.3	1.6	10.0	5.2	0.01	3.44	1.76					14,160	
	Middle Kittanning (No. 6)	1162	2	41	5.2	9.1	35.7	44.6	10.6	5.3	60.3	1.3	19.8	2.8	0.01	1.06	1.69	1.0	2380	2480	2600	10,700	79
			3				39.3	49.1	11.7	4.7	66.3	1.4	12.9	3.1	0.01	1.17	1.86					11,770	
			4				44.5	55.5		5.3	75.1	1.6	14.6	3.5	0.01	1.32	2.10					13,320	
		1187	2	35	3.1	6.3	41.9	49.6	2.2	5.7	73.5	1.5	15.1	2.0	0.01	0.64	1.30	4.5	2100	2180	2260	13,310	79
			3				44.7	52.9	2.3	5.3	78.4	1.6	10.1	2.1	0.01	0.68	1.39					14,200	
			4				45.8	54.2		5.5	80.3	1.6	10.4	2.2	0.01	0.70	1.42					14,550	
Lafayette	Lower Kittanning (No. 5)	1259	2	28	3.4	4.5	37.7	51.5	6.3	5.4	70.3	1.5	13.8	2.7	0.18	1.27	1.29	3.5	2100	2200	2380	12,650	80
			3				39.5	53.9	6.7	5.1	73.6	1.6	10.2	2.9	0.19	1.33	1.35					13,250	
			4				42.3	57.7		5.5	78.8	1.7	10.9	3.1	0.20	1.43	1.45					14,190	
	Middle Kittanning (No. 6)	1160	2	31	2.7	5.6	43.1	48.3	3.0	5.9	72.3	1.5	14.5	2.8	0.01	1.51	1.26	4.0	2120	2230	2340	13,170	79
			3				45.7	51.2	3.2	5.6	76.6	1.6	10.1	3.0	0.01	1.60	1.33					13,950	
			4				47.2	52.8		5.8	79.1	1.6	10.4	3.1	0.01	1.65	1.38					14,410	
Oxford	Lower Kittanning (No. 5)	1257	2	45	3.1	4.1	38.9	50.9	6.1	5.5	71.1	1.4	12.8	3.0	0.15	1.30	1.58	3.5	2040	2190	2330	12,770	80
			3				40.6	53.1	6.4	5.3	74.2	1.5	9.5	3.2	0.16	1.36	1.65					13,320	
			4				43.3	56.7		5.6	79.2	1.6	10.2	3.4	0.17	1.45	1.76					14,230	
		1261	2	26	2.8	3.8	40.7	49.0	6.4	5.4	70.5	1.4	12.4	3.8	0.39	1.56	1.85	4.0	2000	2070	2150	12,700	80
			3				42.3	51.0	6.7	5.2	73.3	1.4	9.4	4.0	0.41	1.62	1.92					13,200	
			4				45.4	54.6		5.6	78.6	1.5	10.1	4.2	0.43	1.74	2.06					14,150	
	Middle Kittanning (No. 6)	1260	2	36	3.7	4.7	40.1	52.5	2.7	5.7	73.3	1.5	14.6	2.2	0.13	0.51	1.55	2.0	2060	2200	2350	13,090	80
			3				42.1	55.1	2.8	5.4	76.9	1.6	11.0	2.3	0.14	0.54	1.63					13,740	
			4				43.3	56.7		5.6	79.2	1.6	11.3	2.4	0.14	0.55	1.67					14,140	
GALLIA COUNTY																								
Clay	Pittsburgh (No. 8)	1146	2	24	2.1	6.1	39.9	45.7	8.3	5.4	65.8	1.2	15.8	3.4	0.01	3.33	0.07	4.5	1950	2050	2170	12,130	79
			3				42.5	48.7	8.8	5.0	70.1	1.3	11.1	3.6	0.01	3.55	0.07					12,910	
			4				46.6	53.4		5.5	76.9	1.4	12.1	4.0	0.01	3.89	0.08					14,170	
		1147	2	32	4.3	7.0	37.0	46.8	9.2	5.7	66.1	1.3	15.0	2.6	0.01	2.00	0.63	4.5	2150	2270	2350	11,860	79
			3				39.8	50.3	9.9	5.3	71.1	1.4	9.4	2.8	0.01	2.15	0.68					12,750	
			4				44.2	55.8		5.9	78.9	1.6	10.5	3.1	0.01	2.39	0.75					14,150	
		1147-1	2	32	3.6	5.9	32.8	37.0	24.3	4.9	53.2	1.0	12.4	4.3	0.03	3.61	0.64	1.5	2290	2420	2530	9,660	79
			3				34.9	39.3	25.8	4.5	56.5	1.1	7.6	4.6	0.03	3.84	0.68					10,260	
			4				47.0	53.0		6.1	76.2	1.4	10.3	6.2	0.04	5.17	0.92					13,840	
		1147-2	2	12	3.8	6.2	36.2	42.6	15.0	5.4	61.5	1.1	13.8	3.3	0.03	2.51	0.81	5.0	2040	2130	2250	11,060	79
			3				38.6	45.4	16.0	5.0	65.6	1.2	8.8	3.5	0.03	2.68	0.86					11,790	
			4				45.9	54.1		6.0	78.0	1.4	10.5	4.2	0.04	3.19	1.03					14,040	
Harrison		1140	2	33	4.3	7.1	37.6	44.6	10.7	5.4	63.8	1.2	14.4	4.5	0.02	3.32	1.18	5.0	1950	2030	2140	11,520	79
			3				40.5	48.0	11.5	5.0	68.7	1.3	8.7	4.8	0.02	3.57	1.27					12,400	
			4				45.7	54.3		5.6	77.6	1.5	9.8	5.5	0.02	4.04	1.44					14,010	
		1140-1	2	14	4.2	6.4	28.7	31.7	33.2	4.3	45.2	0.9	12.6	3.9	0.14	3.10	0.62	1.0	2340	2460	2540	8,230	79
			3				30.7	33.9	35.5	3.8	48.3	1.0	7.4	4.2	0.15	3.31	0.66					8,790	
			4				47.5	52.5		5.9	74.8	1.5	11.4	6.5	0.23	5.13	1.03					13,620	

Township	Seam	DGS file no.	Condition	Analyzed thickness (nearest in)	Air-dried loss (%)	Proximate analysis (%)				Ultimate analysis (%)					Forms of sulfur (%)			Free-swelling index	Fusibility of ash (°F)			Heating value (Btu/lb)	Year
						Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Total sulfur	Sulfate	Pyritic	Organic		Initial deformation temperature	Softening temperature	Fluid temperature		
GALLIA COUNTY (continued)																							
Harrison (continued)	Redstone (No. 8A)	1141	2	15	2.7	6.6	38.2	44.7	10.5	5.5	64.9	1.2	13.9	4.0	0.03	3.51	0.41	3.5	1960	2070	2150	11,770	79
			3				40.9	47.9	11.2	5.1	69.5	1.3	8.6	4.3	0.03	3.76	0.44					12,600	
			4				46.1	53.9		5.7	78.3	1.4	9.7	4.8	0.04	4.23	0.49					14,200	
Walnut	Middle Kittanning (No. 6)	1139	2	33	2.9	7.5	38.2	47.8	6.5	5.6	68.4	1.4	15.8	2.4	0.03	2.00	0.34	0.0	2090	2180	2270	12,280	79
			3				41.3	51.7	7.0	5.2	73.9	1.5	9.9	2.6	0.03	2.16	0.37					13,280	
			4				44.4	55.6		5.5	79.5	1.6	10.6	2.8	0.03	2.33	0.40					14,280	
GUERNSEY COUNTY																							
Jackson	Upper Freeport (No. 7)	1163	2	65	2.9	5.6	35.6	50.5	8.3	5.4	69.3	1.5	13.2	2.4	0.01	2.15	0.23	4.5	2150	2240	2380	12,440	79
			3				37.7	53.5	8.8	5.1	73.4	1.6	8.7	2.5	0.01	2.28	0.24					13,180	
			4				41.3	58.7		5.5	80.5	1.7	9.5	2.8	0.01	2.50	0.27					14,450	
	Anderson	1164	2	18	2.9	5.7	34.9	42.4	17.0	5.2	59.5	1.3	13.6	3.3	0.01	2.64	0.66	1.0	1940	2050	2140	10,800	79
			3				37.0	45.0	18.0	4.8	63.1	1.4	9.0	3.5	0.01	2.80	0.70					11,450	
			4				45.1	54.9		5.9	77.0	1.7	11.0	4.3	0.01	3.42	0.85					13,970	
Londonderry	Pittsburgh (No. 8)	1165	2	52	0.9	2.8	42.5	40.8	13.9	5.2	64.0	1.3	9.0	6.7	0.01	5.16	1.48	4.0	2000	2080	2170	12,010	79
			3				43.7	42.0	14.3	5.0	65.8	1.3	6.7	6.9	0.01	5.31	1.52					12,360	
			4				51.0	49.0		5.9	76.8	1.6	7.8	8.0	0.01	6.19	1.78					14,420	
Washington	Anderson	1166	2	36	2.4	5.0	38.7	49.9	6.4	5.4	70.0	1.6	13.5	3.0	0.01	2.43	0.58	4.5	1960	2070	2150	12,730	79
			3				40.7	52.5	6.7	5.1	73.7	1.7	9.5	3.2	0.01	2.56	0.61					13,390	
			4				43.7	56.3		5.5	79.0	1.8	10.2	3.4	0.01	2.74	0.65					14,360	
HARRISON COUNTY																							
Archer	Pittsburgh (No. 8)	1363	2	55	0.8	2.9	37.7	49.1	10.4	5.1	69.1	1.5	10.7	3.4	0.18	2.02	1.16	4.0	2140	2190	2400	12,450	80
			3				38.8	50.5	10.7	4.9	71.1	1.5	8.4	3.5	0.19	2.08	1.19					12,810	
			4				43.4	56.6		5.5	79.6	1.7	9.4	3.9	0.21	2.33	1.34					14,340	
		1371	2	53	0.9	2.8	37.6	47.5	12.0	4.9	68.8	1.4	9.8	3.1	0.18	1.47	1.46	4.0	2220	2340	2450	12,320	80
			3				38.7	48.9	12.4	4.8	70.8	1.4	7.5	3.2	0.19	1.51	1.50					12,670	
			4				44.2	55.8		5.4	80.8	1.6	8.5	3.7	0.21	1.73	1.71					14,460	
	Redstone (No. 8A)	1364	2	17	0.9	2.8	31.9	38.1	27.2	4.2	55.2	1.3	9.0	3.2	0.04	2.04	1.10	1.0	2130	2220	2490	9,810	80
			3				32.8	39.2	28.0	4.0	56.7	1.3	6.7	3.3	0.04	2.10	1.13					10,090	
			4				45.6	54.4		5.6	78.7	1.8	9.3	4.5	0.06	2.91	1.57					14,010	
		1365	2	17	0.9	2.9	36.3	49.8	11.0	5.0	70.2	1.4	10.8	1.6	0.05	0.57	0.96	4.5	2450	2560	2680	12,520	80
			3				37.4	51.3	11.3	4.8	72.3	1.5	8.4	1.6	0.05	0.59	0.99					12,900	
			4				42.2	57.8		5.4	81.5	1.7	9.5	1.8	0.06	0.66	1.11					14,540	
German	Pittsburgh (No. 8)	1373	2	50	1.2	3.4	35.3	49.5	11.8	4.9	68.4	1.4	10.5	2.9	0.22	1.65	1.06	4.5	2080	2190	2340	12,320	80
			3				36.5	51.3	12.3	4.7	70.8	1.5	7.8	3.0	0.23	1.71	1.10					12,750	
			4				41.6	58.4		5.3	80.7	1.7	8.9	3.5	0.26	1.95	1.25					14,530	
	Redstone (No. 8A)	1366	2	17	0.8	2.7	36.0	47.1	14.2	4.8	67.2	1.5	9.3	3.0	0.14	1.60	1.25	5.0	2160	2230	2500	12,010	80
			3				37.0	48.4	14.6	4.6	69.1	1.5	7.1	3.1	0.14	1.64	1.28					12,340	
			4				43.3	56.7		5.4	80.9	1.8	8.3	3.6	0.17	1.93	1.50					14,450	
Washington	Upper Freeport (No. 7)	1174	2	29	3.4	6.3	35.3	50.7	7.7	5.4	68.8	1.5	14.6	1.9	0.01	1.77	0.12	3.5	2110	2200	2340	12,480	79
			3				37.7	54.1	8.2	5.0	73.4	1.6	9.6	2.0	0.01	1.89	0.13					13,320	
			4				41.0	59.0		5.5	80.0	1.7	10.5	2.2	0.01	2.06	0.14					14,520	
HOCKING COUNTY																							
Starr	Lower Freeport (No. 6A)	1375	2	26	1.8	4.4	40.0	45.3	10.3	5.2	66.9	1.4	12.5	3.8	0.14	1.56	2.06	4.0	2130	2220	2360	12,050	80
			3				41.9	47.4	10.7	4.9	70.0	1.4	9.0	3.9	0.15	1.63	2.15					12,610	
			4				46.9	53.1		5.5	78.4	1.6	10.1	4.4	0.16	1.83	2.41					14,120	

Ward	Upper Freeport (No. 7)	1151	2	47	4.0	7.1	38.2	44.4	10.3	5.5	63.9	1.3	14.1	5.0	0.01	4.18	0.81	3.0	1990	2080	2160	11,660	79
			3				41.1	47.8	11.1	5.1	68.8	1.4	8.4	5.4	0.01	4.50	0.87					12,550	
			4				46.2	53.8		5.7	77.4	1.6	9.4	6.1	0.01	5.06	0.98					14,120	
Washington	Clarion (No. 4A)	1150	2	15	3.8	6.9	41.7	47.2	4.2	5.9	70.6	1.3	16.1	2.0	0.01	0.74	1.29	3.0	2300	2390	2520	12,820	79
			3				44.8	50.7	4.5	5.5	75.8	1.4	10.7	2.1	0.01	0.79	1.39					13,770	
			4				46.9	53.1		5.8	79.4	1.5	11.2	2.2	0.01	0.83	1.45					14,420	
HOLMES COUNTY																							
Berlin	Lower Kittanning (No. 5)	1212	2	36	1.9	4.0	41.3	47.4	7.3	5.5	70.3	1.6	12.1	3.3	0.01	1.98	1.35	4.0	2010	2100	2190	12,780	79
			3				43.0	49.4	7.6	5.3	73.2	1.7	8.9	3.4	0.01	2.06	1.41					13,310	
			4				46.6	53.4		5.7	79.3	1.8	9.6	3.7	0.01	2.23	1.52					14,400	
		1216	2	29	1.7	3.8	44.0	46.2	6.0	5.6	71.4	1.6	11.0	4.4	0.01	3.33	1.01	3.5	1890	1970	2060	13,060	79
			3				45.7	48.0	6.2	5.4	74.2	1.7	7.9	4.6	0.01	3.46	1.05					13,570	
			4				48.8	51.2		5.7	79.2	1.8	8.5	4.9	0.01	3.69	1.12					14,480	
	Middle Kittanning (No. 6)	1207	2	28	6.3	8.6	38.6	47.0	5.8	5.7	68.2	1.4	15.1	3.9	0.01	2.90	0.99	3.0	2010	2100	2220	12,370	79
			3				42.2	51.4	6.3	5.2	74.6	1.5	8.2	4.3	0.01	3.17	1.08					13,530	
			4				45.1	54.9		5.5	79.7	1.6	8.7	4.6	0.01	3.39	1.16					14,450	
		1208	2	18	1.8	3.6	39.0	45.8	11.6	5.0	64.7	1.5	9.4	7.8	0.01	6.85	0.94	4.0	2130	2260	2330	12,010	79
			3				40.5	47.5	12.0	4.8	67.1	1.6	6.4	8.1	0.01	7.11	0.98					12,460	
			4				46.0	54.0		5.4	76.3	1.8	7.3	9.2	0.01	8.08	1.11					14,160	
Clark	Brookville (No. 4)	1214	2	20	1.3	3.0	38.8	44.9	13.3	5.2	66.4	1.5	11.2	2.3	0.01	1.08	1.25	2.0	2640	2720	2790	11,980	79
			3				40.0	46.3	13.7	5.0	68.5	1.5	8.8	2.4	0.01	1.11	1.29					12,350	
			4				46.4	53.6		5.8	79.3	1.8	10.2	2.7	0.01	1.29	1.49					14,320	
	Middle Kittanning (No. 6)	1271	2	35	2.0	4.8	38.6	50.9	5.8	5.3	68.9	1.4	14.5	4.2	0.70	1.81	1.65	2.0	2060	2140	2200	12,410	79
			3				40.5	53.4	6.1	5.0	72.3	1.5	10.7	4.4	0.74	1.90	1.73					13,030	
			4				43.1	56.9		5.4	77.0	1.6	11.4	4.7	0.78	2.02	1.85					13,870	
Hardy	Brookville (No. 4)	1231	2	18	1.2	3.3	47.1	42.4	7.2	5.9	70.4	1.7	12.0	3.0	0.01	0.95	2.01	4.0	2580	2670	2750	12,970	79
			3				48.7	43.8	7.4	5.7	72.8	1.8	9.4	3.1	0.01	0.98	2.08					13,410	
			4				52.6	47.4		6.2	78.7	1.9	10.1	3.4	0.01	1.06	2.25					14,490	
		1239	2	18	1.6	3.4	42.8	46.1	7.7	5.6	69.9	1.6	12.8	2.4	0.02	0.51	1.83	3.0	2550	2620	2700	12,570	79
			3				44.3	47.7	8.0	5.4	72.4	1.7	10.1	2.5	0.02	0.53	1.89					13,010	
			4				48.1	51.9		5.9	78.6	1.8	11.0	2.7	0.02	0.57	2.06					14,140	
	Lower Kittanning (No. 5)	1232	2	8[3]	2.1	4.3	46.6	39.3	9.8	5.8	66.1	1.7	10.7	5.9	0.01	4.09	1.84	4.0	2570	2650	2740	12,350	79
			3				48.7	41.1	10.2	5.6	69.1	1.8	7.2	6.2	0.01	4.27	1.92					12,910	
			4				54.2	45.8		6.2	76.9	2.0	8.0	6.9	0.01	4.76	2.14					14,380	
		1232-1	2	32[4]	3.3	4.8	23.1	22.1	50.0	3.4	33.2	1.0	9.9	2.6	0.02	1.58	0.98	0.0	2620	2730	2800	6,050	79
			3				24.3	23.2	52.5	3.0	34.9	1.1	5.9	2.7	0.02	1.66	1.03					6,350	
			4				51.1	48.9		6.3	73.5	2.2	12.5	5.8	0.04	3.50	2.17					13,380	
Paint	Lower Kittanning (No. 5)	1223	2	19	2.3	4.3	40.6	48.2	6.9	5.5	70.8	1.6	12.8	2.5	0.01	1.18	1.33	4.5	2040	2120	2210	12,760	79
			3				42.4	50.4	7.2	5.2	74.0	1.7	9.4	2.6	0.01	1.23	1.39					13,330	
			4				45.7	54.3		5.7	79.7	1.8	10.1	2.8	0.01	1.33	1.50					14,370	
Salt Creek	Brookville (No. 4)	1215	2	28	1.2	2.9	42.0	44.5	10.6	5.4	68.4	1.4	11.1	3.1	0.01	1.48	1.64	3.0	2410	2500	2580	12,440	79
			3				43.3	45.8	10.9	5.2	70.4	1.4	8.8	3.2	0.01	1.52	1.69					12,810	
			4				48.6	51.4		5.9	79.1	1.6	9.9	3.6	0.01	1.71	1.90					14,380	
Walnut Creek	Lower Kittanning (No. 5)	1213	2	38	1.6	3.5	41.1	47.2	8.2	5.4	69.0	1.5	11.2	4.8	0.01	3.82	1.03	3.0	2030	2110	2200	12,690	79
			3				42.6	48.9	8.5	5.2	71.5	1.6	8.4	5.0	0.01	3.96	1.07					13,150	
			4				46.5	53.5		5.7	78.1	1.7	9.2	5.4	0.01	4.33	1.17					14,370	
	Middle Kittanning (No. 6)	1209	2	23	3.7	6.2	41.0	47.6	5.2	5.7	70.7	1.6	13.9	2.9	0.01	2.46	0.48	3.5	1970	2080	2190	12,830	79
			3				43.7	50.7	5.5	5.3	75.4	1.7	8.9	3.1	0.01	2.62	0.51					13,680	
			4				46.3	53.7		5.7	79.8	1.8	9.5	3.3	0.01	2.78	0.54					14,480	
JACKSON COUNTY																							
Bloomfield	Lower Kittanning (No. 5)	1144	2	36	4.6	7.8	37.4	45.7	9.1	5.5	64.3	1.4	15.8	3.8	0.02	2.84	0.97	3.0	1980	2070	2230	11,640	79
			3				40.6	49.6	9.9	5.0	69.7	1.5	9.6	4.1	0.02	3.08	1.05					12,620	
			4				45.0	55.0		5.6	77.4	1.7	10.7	4.6	0.02	3.42	1.17					14,000	

Township	Seam	DGS file no.	Condition	Analyzed thickness (nearest in)	Air-dried loss (%)	Proximate analysis (%)				Ultimate analysis (%)					Forms of sulfur (%)			Free-swelling index	Fusibility of ash (°F)			Heating value (Btu/lb)	Year
						Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Total sulfur	Sulfate	Pyritic	Organic		Initial deformation temperature	Softening temperature	Fluid temperature		
JACKSON COUNTY (continued)																							
Liberty	Sharon (No. 1)	1134	2	26	3.6	8.4	38.4	40.3	12.9	5.6	62.2	1.5	17.0	0.9	0.01	0.61	0.25	1.0	2800	2800	2800	11,220	79
			3				41.9	44.0	14.1	5.1	67.9	1.6	10.4	1.0	0.01	0.67	0.27					12,250	
			4				48.8	51.2		5.9	79.0	1.9	12.1	1.1	0.01	0.78	0.32					14,260	
		1135	2	25	4.0	9.6	30.4	39.1	20.9	5.0	53.4	1.2	19.0	0.5	0.01	0.31	0.22	0.0	2800	2800	2800	9,470	79
			3				33.6	43.3	23.1	4.4	59.1	1.3	11.6	0.6	0.01	0.34	0.24					10,480	
			4				43.7	56.3		5.7	76.8	1.7	15.1	0.7	0.01	0.45	0.32					13,630	
Madison	Lower Kittanning (No. 5)	1268	2	18	3.2	4.3	36.4	46.5	12.8	4.9	63.8	1.3	12.9	4.3	0.26	2.48	1.59	1.5	2080	2160	2340	11,450	80
			3				38.0	48.6	13.4	4.6	66.7	1.3	9.4	4.5	0.27	2.59	1.66					11,970	
			4				43.9	56.1		5.4	77.0	1.5	10.9	5.2	0.31	2.99	1.92					13,820	
	Middle Kittanning (No. 6)	1137	2	17[5]	3.9	8.6	39.7	47.7	4.0	6.0	70.0	1.5	17.2	1.4	0.07	0.96	0.34	1.0	2000	2120	2210	12,540	79
			3				43.4	52.2	4.4	5.5	76.6	1.6	10.5	1.5	0.08	1.05	0.37					13,720	
			4				45.4	54.6		5.8	80.1	1.7	10.9	1.6	0.08	1.10	0.39					14,340	
		1138	2	16[5]	7.0	10.2	32.9	49.5	7.4	5.7	64.6	1.4	18.1	2.8	0.05	2.07	0.67	1.5	2120	2240	2330	11,460	79
			3				36.6	55.1	8.2	5.1	71.9	1.6	10.1	3.1	0.06	2.31	0.75					12,760	
			4				39.9	60.1		5.5	78.4	1.7	11.0	3.4	0.06	2.51	0.81					13,900	
Milton	Clarion (No. 4A)	1148	2	33	3.9	7.8	42.8	43.6	5.8	6.2	66.8	1.3	16.7	3.2	0.01	1.52	1.69	4.0	1960	2050	2150	12,120	79
			3				46.4	47.3	6.3	5.8	72.5	1.4	10.6	3.5	0.01	1.65	1.83					13,150	
			4				49.5	50.5		6.2	77.3	1.5	11.3	3.7	0.01	1.76	1.96					14,030	
		1148-1	2	16	4.1	7.2	40.9	42.3	9.6	5.8	63.8	1.2	16.1	3.4	0.03	1.40	2.01	3.5	2190	2280	2400	11,620	79
			3				44.1	45.6	10.3	5.4	68.7	1.3	10.5	3.7	0.03	1.51	2.17					12,520	
			4				49.2	50.8		6.0	76.7	1.4	11.7	4.1	0.04	1.68	2.42					13,960	
	Lower Kittanning (No. 5)	1258	2	30	4.8	6.1	34.5	46.2	13.2	4.9	63.0	1.3	16.8	0.8	0.08	0.17	0.57	0.5	2750	2800	2800	11,000	80
			3				36.8	49.2	14.0	4.5	67.1	1.3	12.1	0.9	0.09	0.18	0.61					11,720	
			4				42.8	57.2		5.2	78.1	1.6	14.1	1.0	0.10	0.21	0.71					13,630	
JEFFERSON COUNTY																							
Island Creek	Pittsburgh (No. 8)	1374	2	56	0.7	2.7	34.9	49.4	13.0	4.8	68.0	1.5	9.5	3.2	0.22	1.89	1.04	5.5	2120	2250	2530	12,290	80
			3				35.9	50.7	13.4	4.7	69.9	1.5	7.3	3.2	0.23	1.94	1.07					12,630	
			4				41.4	58.6		5.4	80.7	1.7	8.5	3.7	0.26	2.24	1.23					14,580	
Ross		1372	2	26	0.8	2.6	36.4	50.5	10.5	5.0	70.5	1.5	10.0	2.6	0.14	1.45	0.97	6.5	2160	2230	2400	12,560	80
			3				37.4	51.8	10.8	4.8	72.4	1.5	7.9	2.6	0.14	1.49	1.00					12,900	
			4				41.9	58.1		5.4	81.1	1.7	8.9	2.9	0.16	1.67	1.12					14,460	
Warren	Waynesburg (No. 11)	1369	2	46	1.3	4.1	30.8	45.6	19.6	4.6	60.3	1.3	12.7	1.5	0.38	0.63	0.53	1.5	2460	2650	2800	10,680	80
			3				32.1	47.5	20.4	4.3	62.9	1.3	9.5	1.6	0.40	0.66	0.55					11,130	
			4				40.3	59.7		5.4	79.0	1.6	11.9	2.0	0.50	0.82	0.69					13,980	
Wayne	Redstone (No. 8A)	1370	2	22	0.8	3.0	36.8	50.3	10.0	5.0	69.6	1.5	10.4	3.6	0.30	1.97	1.29	4.5	2000	2080	2300	12,530	80
			3				37.9	51.9	10.3	4.8	71.7	1.5	8.1	3.7	0.31	2.03	1.33					12,910	
			4				42.2	57.8		5.3	79.9	1.7	9.0	4.1	0.34	2.26	1.48					14,390	
Wells	Pittsburgh (No. 8)	1368	2	46	1.4	3.4	35.4	57.0	4.2	5.5	76.6	1.5	11.1	1.0	0.06	0.42	0.54	6.0	2600	2720	2800	13,550	80
			3				36.6	59.0	4.4	5.3	79.3	1.6	8.4	1.1	0.06	0.43	0.56					14,030	
			4				38.3	61.7		5.5	82.9	1.7	8.8	1.1	0.06	0.45	0.58					14,670	
		1368-1	2	25	1.0	2.8	30.6	45.4	21.1	4.4	61.3	1.3	9.2	2.6	0.15	1.72	0.70	5.5	2450	2600	2740	10,790	80
			3				31.5	46.7	21.8	4.3	63.1	1.3	6.9	2.6	0.15	1.77	0.72					11,100	
			4				40.3	59.7		5.4	80.7	1.6	8.9	3.4	0.20	2.26	0.92					14,190	
	Redstone (No. 8A)	1367	2	25	0.8	2.4	31.4	44.6	21.7	4.4	62.1	1.2	8.2	2.4	0.07	1.30	1.00	4.5	2320	2470	2570	10,990	80
			3				32.1	45.7	22.2	4.3	63.6	1.2	6.3	2.4	0.07	1.33	1.02					11,260	
			4				41.3	58.7		5.5	81.8	1.6	8.0	3.1	0.09	1.71	1.32					14,480	

LAWRENCE COUNTY																								
Decatur	Lower Kittanning (No. 5)	1133	2	39	6.3	9.6	35.7	48.1	6.6	5.8	66.2	1.4	18.7	1.3	0.01	0.65	0.66	3.5	2580	2660	2780	11,780	79
			3				39.5	53.2	7.3	5.2	73.2	1.5	11.2	1.4	0.01	0.72	0.73					13,030	
			4				42.6	57.4		5.6	79.0	1.7	12.1	1.6	0.01	0.78	0.79					14,060	
Mason	Redstone (No. 8A)	1142	2	49	2.2	6.2	40.6	42.9	10.3	5.5	63.5	1.1	13.7	6.0	0.03	5.63	0.36	0.0	2000	2090	2200	11,620	79
			3				43.3	45.7	11.0	5.1	67.7	1.2	8.7	6.4	0.03	6.00	0.38					12,390	
			4				48.6	51.4		5.8	76.0	1.3	9.8	7.2	0.04	6.74	0.43					13,920	
		1143	2	45	2.8	7.0	39.4	42.8	10.8	5.4	62.8	1.1	14.3	5.7	0.15	5.01	0.50	4.5	1910	2000	2110	11,560	79
			3				42.4	46.0	11.6	5.0	67.5	1.2	8.7	6.1	0.16	5.39	0.54					12,430	
			4				47.9	52.1		5.6	76.4	1.3	9.8	6.9	0.18	6.09	0.61					14,060	
		1143-1	2	23	2.3	4.3	26.6	22.1	47.0	3.6	34.2	0.6	9.1	5.6	0.09	4.79	0.74	1.0	2270	2390	2520	6,240	79
			3				27.8	23.1	49.1	3.3	35.7	0.6	5.5	5.9	0.09	5.01	0.77					6,520	
			4				54.6	45.4		6.4	70.2	1.2	10.8	11.5	0.18	9.84	1.52					12,810	
Washington	Clarion (No. 4A)	1131	2	32	3.2	7.8	41.7	42.8	7.7	5.9	65.6	1.3	15.7	3.9	0.01	2.50	1.34	0.0	1910	2030	2110	11,950	79
			3				45.2	46.4	8.4	5.5	71.1	1.4	9.5	4.2	0.01	2.71	1.45					12,960	
			4				49.3	50.7		6.0	77.6	1.5	10.4	4.6	0.01	2.96	1.59					14,140	
	Lower Kittanning (No. 5)	1132	2	25	6.3	9.5	34.9	45.0	10.6	5.6	62.1	1.3	17.7	2.6	0.01	1.83	0.75	1.0	1980	2080	2170	11,020	79
			3				38.6	49.7	11.7	5.0	68.6	1.4	10.2	2.9	0.01	2.02	0.83					12,180	
			4				43.7	56.3		5.7	77.7	1.6	11.6	3.3	0.01	2.29	0.94					13,790	
LICKING COUNTY																								
Bowling Green	Quakertown (No. 2)	1253	2	25	5.3	6.3	32.2	50.6	10.9	5.1	66.0	1.5	15.3	1.3	0.11	1.07	0.10	2.0	2650	2770	2800	11,650	80
			3				34.3	54.0	11.7	4.7	70.4	1.6	10.4	1.4	0.12	1.14	0.11					12,430	
			4				38.8	61.2		5.3	79.7	1.8	11.7	1.5	0.13	1.29	0.12					14,070	
	Bear Run	1254	2	16	1.5	2.5	28.7	38.9	29.9	3.8	53.7	1.0	9.7	1.8	0.14	0.61	1.09	1.0	2650	2780	2800	9,460	80
			3				29.4	39.9	30.7	3.6	55.1	1.1	7.6	1.9	0.14	0.63	1.12					9,710	
			4				42.5	57.5		5.2	79.5	1.5	11.0	2.7	0.21	0.90	1.61					14,010	
MAHONING COUNTY																								
Springfield	Lower Kittanning (No. 5)	1210	2	35	1.0	2.5	36.7	55.7	5.1	5.5	77.3	1.8	9.6	0.7	0.01	0.10	0.60	6.5	2800	2800	2800	13,740	79
			3				37.6	57.1	5.2	5.4	79.3	1.8	7.6	0.7	0.01	0.10	0.62					14,090	
			4				39.7	60.3		5.7	83.7	1.9	8.0	0.8	0.01	0.11	0.65					14,870	
MUSKINGUM COUNTY																								
Adams	Middle Kittanning (No. 6)	1157	2	47	2.4	5.0	44.4	47.1	3.5	6.1	72.8	1.4	13.2	3.1	0.01	1.23	1.85	3.5	2180	2290	2370	13,300	79
			3				46.7	49.6	3.7	5.8	76.6	1.5	9.2	3.3	0.01	1.29	1.95					14,000	
			4				48.5	51.5		6.1	79.6	1.5	9.6	3.4	0.01	1.34	2.02					14,530	
Highland	Anderson	1158	2	27	2.3	4.7	37.3	46.6	11.4	5.3	66.3	1.4	11.9	3.7	0.01	2.43	1.28	5.0	2010	2090	2210	11,950	79
			3				39.1	48.9	12.0	5.0	69.6	1.5	8.1	3.9	0.01	2.55	1.34					12,540	
			4				44.5	55.5		5.7	79.0	1.7	9.2	4.4	0.01	2.90	1.53					14,250	
NOBLE COUNTY																								
Brookfield	Meigs Creek (No. 9)	1206	2	56	2.9	5.1	35.2	43.5	16.2	4.8	60.1	1.0	14.2	3.7	0.01	0.93	2.80	1.0	2080	2200	2350	10,670	79
			3				37.1	45.8	17.1	4.5	63.3	1.1	10.2	3.9	0.01	0.98	2.95					11,250	
			4				44.7	55.3		5.4	76.4	1.3	12.3	4.7	0.01	1.18	3.56					13,560	
PERRY COUNTY																								
Clayton	Middle Kittanning (No. 6)	1153	2	32	3.5	6.5	43.2	45.3	5.0	5.8	68.7	1.4	16.5	2.6	0.02	1.52	1.06	3.5	1920	2030	2120	12,680	79
			3				46.2	48.4	5.3	5.4	73.5	1.5	11.5	2.8	0.02	1.63	1.13					13,560	
			4				48.8	51.2		5.7	77.6	1.6	12.1	2.9	0.02	1.72	1.20					14,330	
Monroe	Upper Freeport (No. 7)	1156	2	51	3.8	7.8	36.3	48.6	7.3	5.6	67.7	1.4	16.0	2.0	0.01	1.88	0.12	3.0	2170	2310	2400	12,050	79
			3				39.4	52.7	7.9	5.1	73.4	1.5	9.8	2.2	0.01	2.04	0.13					13,060	
			4				42.8	57.2		5.6	79.7	1.6	10.7	2.4	0.01	2.21	0.14					14,190	
Pike	Middle Kittanning (No. 6)	1152	2	49	3.5	7.1	38.8	43.3	10.8	5.4	64.4	1.3	15.1	3.0	0.02	2.07	0.89	3.5	2090	2170	2280	11,650	79
			3				41.8	46.6	11.6	5.0	69.3	1.4	9.5	3.2	0.02	2.23	0.96					12,540	
			4				47.3	52.7		5.6	78.4	1.6	10.7	3.7	0.02	2.52	1.08					14,190	
PIKE COUNTY																								
Marion	Sharon (No. 1)	1136	2	22	5.5	9.0	31.2	46.1	13.7	5.5	60.5	1.3	18.4	0.6	0.01	0.41	0.18	1.0	2800	2800	2800	10,590	79
			3				34.3	50.7	15.1	4.9	66.5	1.4	11.4	0.7	0.01	0.45	0.20					11,640	
			4				40.4	59.6		5.8	78.3	1.7	13.5	0.8	0.01	0.53	0.23					13,700	

Township	Seam	DGS file no.	Condition	Analyzed thickness (nearest in)	Air-dried loss (%)	Proximate analysis (%)				Ultimate analysis (%)					Forms of sulfur (%)			Free-swelling index	Fusibility of ash (°F)			Heating value (Btu/lb)	Year
						Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Total sulfur	Sulfate	Pyritic	Organic		Initial deformation temperature	Softening temperature	Fluid temperature		
STARK COUNTY																							
Bethlehem	Tionesta (No. 3B)	1238	2	40	1.2	3.5	39.3	44.5	12.7	5.2	65.6	1.7	10.0	4.8	0.01	3.65	1.14	4.0	1970	2040	2100	12,050	79
			3				40.7	46.1	13.2	5.0	68.0	1.8	7.1	5.0	0.01	3.78	1.18					12,490	
			4				46.9	53.1		5.7	78.3	2.0	8.2	5.7	0.01	4.36	1.36					14,380	
	Brookville (No. 4)	1237	2	22	1.0	3.2	41.6	47.9	7.3	5.4	70.3	1.7	12.5	2.8	0.02	1.34	1.49	2.5	1970	2140	2270	12,730	79
			3				43.0	49.5	7.5	5.2	72.6	1.8	10.0	2.9	0.02	1.38	1.54					13,150	
			4				46.5	53.5		5.6	78.5	1.9	10.8	3.1	0.02	1.50	1.66					14,230	
Osnaburg	Middle Kittanning (No. 6)	1245	2	33	1.5	3.6	41.2	47.7	7.5	5.5	71.2	1.8	11.3	2.7	0.01	1.61	1.12	4.0	2420	2530	2610	12,920	79
			3				42.7	49.5	7.8	5.3	73.9	1.9	8.4	2.8	0.01	1.67	1.16					13,400	
			4				46.3	53.7		5.7	80.1	2.0	9.1	3.0	0.01	1.81	1.26					14,530	
Paris	Lower Kittanning (No. 5)	1211	2	35	1.0	2.6	42.3	47.4	7.7	5.3	70.6	1.5	9.1	5.8	0.01	4.31	1.49	3.5	1960	2070	2160	13,090	79
			3				43.4	48.7	7.9	5.1	72.5	1.5	7.0	6.0	0.01	4.43	1.53					13,440	
			4				47.2	52.8		5.6	78.7	1.7	7.6	6.5	0.01	4.80	1.66					14,590	
		1248	2	22	0.8	2.7	41.8	48.4	7.1	5.4	71.3	1.7	9.3	5.2	0.01	4.09	1.05	4.5	1960	2020	2070	13,100	79
			3				43.0	49.7	7.3	5.2	73.3	1.7	7.1	5.3	0.01	4.20	1.08					13,460	
			4				46.3	53.7		5.7	79.0	1.9	7.6	5.8	0.01	4.53	1.16					14,520	
	Middle Kittanning (No. 6)	1240	2	26	1.4	3.1	37.7	48.8	10.4	5.2	69.9	1.6	10.8	2.0	0.02	0.95	1.06	4.0	2590	2680	2760	12,600	79
			3				38.9	50.4	10.7	5.0	72.1	1.7	8.3	2.1	0.02	0.98	1.09					13,000	
			4				43.6	56.4		5.6	80.8	1.8	9.3	2.3	0.02	1.10	1.23					14,560	
		1249	2	26	1.3	3.4	37.3	48.8	10.5	5.3	69.6	1.7	10.9	2.1	0.01	1.18	0.95	3.5	2510	2590	2680	12,510	79
			3				38.6	50.5	10.9	5.1	72.0	1.8	8.2	2.2	0.01	1.22	0.98					12,950	
			4				43.3	56.7		5.7	80.8	2.0	9.1	2.4	0.01	1.37	1.10					14,530	
	Upper Freeport (No. 7)	1250	2	15	0.6	2.3	37.4	42.8	17.5	4.9	63.7	1.5	9.1	3.3	0.01	2.54	0.78	4.5	2220	2310	2400	11,600	79
			3				38.3	43.8	17.9	4.8	65.2	1.5	7.2	3.4	0.01	2.60	0.80					11,870	
			4				46.6	53.4		5.8	79.4	1.9	8.8	4.1	0.01	3.17	0.97					14,470	
Sugar Creek	Lower Mercer (No. 3)	1217	2	22	1.9	3.9	38.5	49.7	7.9	5.4	71.3	1.6	12.3	1.4	0.01	0.82	0.55	2.5	2700	2790	2800	12,730	79
			3				40.1	51.7	8.2	5.2	74.2	1.7	9.2	1.5	0.01	0.85	0.57					13,250	
			4				43.7	56.3		5.6	80.8	1.8	10.0	1.6	0.01	0.93	0.62					14,430	
		1217-1	2	17	4.6	6.2	25.2	32.2	36.4	4.0	43.9	1.1	12.9	1.8	0.01	1.40	0.40	1.0	2760	2800	2800	7,800	79
			3				26.9	34.3	38.8	3.5	46.8	1.2	7.9	1.9	0.01	1.49	0.43					8,320	
			4				43.9	56.1		5.8	76.5	1.9	12.9	3.1	0.02	2.44	0.70					13,590	
	Bedford	1218	2	18	3.7	5.7	30.8	38.8	24.7	4.4	51.9	1.2	13.8	4.0	0.01	3.51	0.45	1.5	2530	2610	2690	9,410	79
			3				32.7	41.1	26.2	4.0	55.0	1.3	9.3	4.2	0.01	3.72	0.48					9,980	
			4				44.3	55.7		5.4	74.6	1.7	12.5	5.7	0.01	5.04	0.65					13,520	
	Tionesta (No. 3B)	1219	2	11	0.9	2.0	34.7	30.9	32.4	4.1	45.6	1.1	6.2	10.6	0.01	8.67	1.88	2.5	2060	2140	2220	8,780	79
			3				35.4	31.5	33.1	4.0	46.5	1.1	4.5	10.8	0.01	8.85	1.92					8,960	
			4				52.9	47.1		5.9	69.5	1.7	6.7	16.2	0.02	13.22	2.87					13,390	
	Brookville (No. 4)	1220	2	24	1.3	3.1	43.5	49.2	4.2	5.6	73.9	1.6	11.7	3.1	0.01	1.51	1.54	5.5	1950	2040	2150	13,400	79
			3				44.9	50.8	4.3	5.4	76.3	1.7	9.2	3.2	0.01	1.56	1.59					13,830	
			4				46.9	53.1		5.7	79.7	1.7	9.6	3.3	0.01	1.63	1.66					14,460	
		1220-1	2	14	1.1	2.6	40.0	42.0	15.4	5.0	62.8	1.4	10.9	4.4	0.01	2.77	1.67	4.5	2520	2610	2720	11,510	79
			3				41.1	43.1	15.8	4.8	64.5	1.4	8.8	4.5	0.01	2.84	1.71					11,810	
			4				48.8	51.2		5.7	76.6	1.7	10.5	5.4	0.01	3.38	2.04					14,030	
TUSCARAWAS COUNTY																							
Auburn	Middle Kittanning (No. 6)	1178	2	32	2.8	5.4	40.2	45.5	8.9	5.5	66.9	1.4	12.4	4.9	0.03	3.60	1.30	4.5	1980	2080	2170	12,320	79
			3				42.5	48.1	9.4	5.2	70.7	1.5	8.0	5.2	0.03	3.81	1.37					13,020	
			4				46.9	53.1		5.7	78.1	1.6	8.9	5.7	0.04	4.20	1.52					14,370	

Bucks	Lower Kittanning (No. 5)	1180	2	21	2.3	5.5	41.1	48.4	5.0	5.5	71.0	1.4	14.2	2.9	0.03	1.73	1.15	3.0	1970	2080	2160	12,780	79
			3				43.5	51.2	5.3	5.2	75.1	1.5	9.9	3.1	0.03	1.83	1.22					13,530	
			4				45.9	54.1		5.5	79.3	1.6	10.4	3.2	0.03	1.93	1.28					14,280	
		1185	2	24	2.7	5.4	40.6	48.0	6.0	5.5	70.2	1.5	13.5	3.4	0.03	1.81	1.52	4.5	2090	2210	2320	12,760	79
			3				42.9	50.7	6.3	5.2	74.2	1.6	9.2	3.6	0.03	1.91	1.61					13,490	
			4				45.8	54.2		5.5	79.2	1.7	9.8	3.8	0.03	2.04	1.72					14,400	
	Middle Kittanning (No. 6)	1186	2	20	3.7	7.2	38.4	50.2	4.2	5.3	70.4	1.4	16.8	1.9	0.01	1.08	0.81	1.5	1900	2020	2140	12,550	79
			3				41.4	54.1	4.5	4.8	75.9	1.5	11.2	2.0	0.01	1.16	0.87					13,530	
			4				43.3	56.7		5.1	79.5	1.6	11.7	2.1	0.01	1.22	0.91					14,170	
Clay		1221	2	38	1.1	2.6	42.2	48.3	6.9	5.5	72.7	1.6	10.1	3.3	0.01	2.02	1.24	4.5	2000	2110	2220	13,100	79
			3				43.3	49.6	7.1	5.4	74.6	1.6	8.0	3.4	0.01	2.07	1.27					13,450	
			4				46.6	53.4		5.8	80.3	1.8	8.6	3.6	0.01	2.23	1.37					14,470	
Dover	Brookville (No. 4)	1130	2	19	3.0	5.4	37.6	43.2	13.8	5.4	64.6	1.3	12.2	2.7	0.03	1.44	1.23	5.0	2000	2110	2200	11,610	79
			3				39.7	45.7	14.6	5.1	68.3	1.4	7.8	2.9	0.03	1.52	1.30					12,280	
			4				46.5	53.5		5.9	80.0	1.6	9.2	3.3	0.04	1.78	1.52					14,370	
	Lower Kittanning (No. 5)	1129	2	36	3.6	6.5	39.7	47.5	6.3	5.7	68.6	1.4	13.8	4.1	0.01	2.44	1.68	5.5	1960	2040	2160	12,440	79
			3				42.5	50.8	6.7	5.3	73.4	1.5	8.6	4.4	0.01	2.61	1.80					13,300	
			4				45.5	54.5		5.7	78.7	1.6	9.2	4.7	0.01	2.80	1.93					14,260	
		1196	2	43	3.4	6.6	38.4	49.0	6.0	5.6	69.7	1.4	14.0	3.4	0.02	1.86	1.52	3.5	1850	1970	2060	12,580	79
			3				41.1	52.5	6.4	5.2	74.6	1.5	8.7	3.6	0.02	1.99	1.63					13,470	
			4				43.9	56.1		5.6	79.7	1.6	9.3	3.9	0.02	2.13	1.74					14,390	
		1229	2	50	2.8	5.2	40.3	45.6	8.9	5.4	67.4	1.4	12.2	4.8	0.01	2.84	1.98	5.0	1930	2070	2150	12,390	79
			3				42.5	48.1	9.4	5.1	71.1	1.5	8.0	5.1	0.01	3.00	2.09					13,070	
			4				46.9	53.1		5.6	78.5	1.6	8.8	5.6	0.01	3.31	2.31					14,430	
	Strasburg (No. 5A)	1197	2	26	5.5	8.4	40.4	44.9	6.3	5.7	67.5	1.5	18.0	1.1	0.01	0.38	0.70	1.0	2400	2490	2590	12,090	79
			3				44.1	49.0	6.9	5.2	73.7	1.6	11.5	1.2	0.01	0.41	0.76					13,190	
			4				47.4	52.6		5.6	79.1	1.8	12.3	1.3	0.01	0.45	0.82					14,170	
		1205	2	22	1.5	3.7	43.4	39.5	13.4	5.4	64.5	1.4	9.1	6.3	0.04	4.77	1.48	3.0	1940	2010	2090	12,040	79
			3				45.1	41.0	13.9	5.2	67.0	1.5	6.0	6.5	0.04	4.95	1.54					12,500	
			4				52.4	47.6		6.0	77.8	1.7	7.0	7.6	0.05	5.75	1.79					14,520	
		1228	2	33	3.3	5.2	38.6	39.4	16.8	5.1	59.4	1.3	10.7	6.6	0.01	4.41	2.18	2.5	1880	2000	2080	11,160	79
			3				40.7	41.6	17.7	4.8	62.7	1.4	6.4	7.0	0.01	4.65	2.30					11,770	
			4				49.5	50.5		5.8	76.2	1.7	7.8	8.5	0.01	5.65	2.79					14,310	
	Middle Kittanning (No. 6)	1128	2	35	3.9	6.5	40.4	48.0	5.1	5.9	70.4	1.4	14.2	3.0	0.19	1.14	1.63	4.0	2130	2220	2350	12,660	79
			3				43.2	51.3	5.5	5.5	75.3	1.5	9.0	3.2	0.20	1.22	1.74					13,530	
			4				45.7	54.3		5.9	79.6	1.6	9.5	3.4	0.21	1.29	1.84					14,320	
		1198	2	36	4.6	8.1	37.9	50.6	3.4	5.6	69.0	1.5	18.8	1.9	0.02	0.25	1.59	1.0	2750	2800	2800	12,200	79
			3				41.2	55.1	3.7	5.1	75.1	1.6	12.6	2.1	0.02	0.27	1.73					13,270	
			4				42.8	57.2		5.3	78.0	1.7	13.1	2.1	0.02	0.28	1.80					13,780	
Fairfield	Lower Kittanning (No. 5)	1188	2	26	2.1	4.8	39.5	46.6	9.1	5.3	68.1	1.4	12.3	3.8	0.02	2.36	1.43	4.5	2070	2200	2330	12,410	79
			3				41.5	48.9	9.6	5.0	71.5	1.5	8.4	4.0	0.02	2.48	1.50					13,040	
			4				45.9	54.1		5.5	79.1	1.6	9.3	4.4	0.02	2.74	1.66					14,420	
	Strasburg (No. 5A)	1190	2	13	2.3	4.6	39.0	40.6	15.8	5.1	59.5	1.4	11.0	7.2	0.02	5.48	1.70	3.0	2010	2090	2210	11,230	79
			3				40.9	42.6	16.6	4.8	62.4	1.5	7.2	7.5	0.02	5.74	1.78					11,770	
			4				49.0	51.0		5.8	74.7	1.8	8.7	9.0	0.03	6.88	2.14					14,110	
	Middle Kittanning (No. 6)	1181	2	51	2.3	5.2	41.7	47.8	5.3	5.6	71.8	1.5	13.0	2.8	0.01	1.02	1.81	3.0	2020	2130	2230	12,940	79
			3				44.0	50.4	5.6	5.3	75.7	1.6	8.8	3.0	0.01	1.08	1.91					13,650	
			4				46.6	53.4		5.6	80.2	1.7	9.4	3.1	0.01	1.14	2.02					14,460	
		1191	2	40	3.0	6.0	39.2	49.6	5.2	5.4	70.2	1.6	15.0	2.6	0.01	1.28	1.33	3.0	1970	2090	2200	12,620	79
			3				41.7	52.8	5.5	5.0	74.7	1.7	10.3	2.8	0.01	1.36	1.41					13,420	
			4				44.1	55.9		5.3	79.1	1.8	10.9	2.9	0.01	1.44	1.50					14,210	
Franklin	Lower Kittanning (No. 5)	1193	2	31	2.0	4.7	41.6	42.5	11.2	5.5	65.0	1.3	10.5	6.6	0.19	4.66	1.79	3.5	1910	2040	2130	12,010	79
			3				43.7	44.6	11.8	5.2	68.2	1.4	6.6	6.9	0.20	4.89	1.88					12,600	
			4				49.5	50.5		5.9	77.3	1.5	7.5	7.8	0.23	5.54	2.13					14,280	
	Strasburg (No. 5A)	1194	2	18	1.6	3.9	48.2	39.0	8.9	5.9	68.3	1.5	11.4	4.1	0.04	2.68	1.36	2.0	1940	2020	2120	12,740	79
			3				50.2	40.6	9.3	5.7	71.1	1.6	8.3	4.3	0.04	2.79	1.42					13,250	
			4				55.3	44.7		6.3	78.3	1.7	9.1	4.7	0.05	3.07	1.56					14,610	

Township	Seam	DGS file no.	Condition	Analyzed thickness (nearest in)	Air-dried loss (%)	Proximate analysis (%)				Ultimate analysis (%)					Forms of sulfur (%)			Free-swelling index	Fusibility of ash (°F)			Heating value (Btu/lb)	Year
						Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Total sulfur	Sulfate	Pyritic	Organic		Initial deformation temperature	Softening temperature	Fluid temperature		
TUSCARAWAS COUNTY (continued)																							
Franklin (continued)	Middle Kittanning (No. 6)	1195	2	20	1.3	3.2	49.7	40.1	7.0	6.0	69.8	1.5	12.4	3.2	0.01	1.86	1.35	3.0	2030	2150	2300	13,300	79
			3				51.3	41.4	7.2	5.8	72.1	1.5	9.9	3.3	0.01	1.92	1.39					13,740	
			4				55.3	44.7		6.3	77.7	1.7	10.6	3.6	0.01	2.07	1.50					14,810	
		1199	2	26	9.1	13.0	37.4	41.6	8.0	5.5	59.3	1.4	24.7	1.1	0.02	0.25	0.82	1.0	2750	2800	2800	10,450	79
			3				43.0	47.8	9.2	4.7	68.2	1.6	15.1	1.3	0.02	0.29	0.94					12,010	
			4				47.3	52.7		5.1	75.1	1.8	16.6	1.4	0.03	0.32	1.04					13,230	
Goshen		1202	2	56	2.4	4.7	41.5	47.4	6.4	5.5	69.8	1.4	13.9	3.0	0.01	1.35	1.66	4.5	2070	2160	2310	12,890	79
			3				43.5	49.7	6.7	5.2	73.2	1.5	10.2	3.1	0.01	1.42	1.74					13,530	
			4				46.7	53.3		5.6	78.5	1.6	10.9	3.4	0.01	1.52	1.87					14,500	
		1222	2	46	1.5	3.3	41.7	49.2	5.8	5.4	72.3	1.6	11.6	3.4	0.01	1.69	1.66	5.5	2060	2140	2230	13,170	79
			3				43.1	50.9	6.0	5.2	74.8	1.7	9.0	3.5	0.01	1.75	1.72					13,620	
			4				45.9	54.1		5.5	79.5	1.8	9.5	3.7	0.01	1.86	1.83					14,490	
		1252	2	47	1.4	3.9	39.0	49.5	7.6	5.3	70.6	1.8	12.5	2.2	0.01	0.85	1.30	2.5	2500	2570	2650	12,680	79
			3				40.6	51.5	7.9	5.1	73.5	1.9	9.4	2.3	0.01	0.88	1.35					13,190	
			4				44.1	55.9		5.5	79.8	2.0	10.2	2.5	0.01	0.96	1.47					14,320	
Jefferson		1179	2	29	2.8	5.7	41.4	48.6	4.3	5.9	71.1	1.6	14.4	2.7	0.02	1.58	1.15	4.5	1970	2070	2160	12,950	79
			3				43.9	51.5	4.6	5.6	75.4	1.7	9.9	2.9	0.02	1.68	1.22					13,740	
			4				46.0	54.0		5.9	79.0	1.8	10.4	3.0	0.02	1.76	1.28					14,390	
Lawrence	Strasburg (No. 5A)	1182	2	22	1.8	4.1	44.0	40.1	11.8	5.5	65.9	1.5	10.6	4.8	0.05	3.46	1.26	2.5	1940	2050	2170	12,170	79
			3				45.9	41.8	12.3	5.3	68.7	1.6	7.3	5.0	0.05	3.61	1.31					12,690	
			4				52.3	47.7		6.0	78.4	1.8	8.3	5.7	0.06	4.11	1.50					14,470	
	Middle Kittanning (No. 6)	1183	2	34	1.8	4.5	43.3	43.9	8.3	5.5	69.2	1.4	13.2	2.5	0.02	1.07	1.37	4.0	2470	2570	2660	12,570	79
			3				45.3	46.0	8.7	5.2	72.5	1.5	9.6	2.6	0.02	1.12	1.43					13,170	
			4				49.7	50.3		5.7	79.4	1.6	10.6	2.9	0.02	1.23	1.57					14,420	
Salem	Lower Kittanning (No. 5)	1171	2	40	2.3	4.6	40.2	48.2	7.0	5.8	69.7	1.5	12.4	3.7	0.01	1.98	1.70	4.0	2120	2200	2340	12,840	79
			3				42.1	50.5	7.3	5.5	73.1	1.6	8.7	3.9	0.01	2.08	1.78					13,460	
			4				45.5	54.5		6.0	78.8	1.7	9.4	4.2	0.01	2.24	1.92					14,520	
	Middle Kittanning (No. 6)	1168	2	49	1.7	3.9	42.7	46.0	7.4	5.7	69.3	1.4	12.7	3.5	0.01	1.95	1.55	3.0	2050	2140	2230	12,960	79
			3				44.4	47.9	7.7	5.5	72.1	1.5	9.6	3.6	0.01	2.03	1.61					13,480	
			4				48.1	51.9		5.9	78.1	1.6	10.4	3.9	0.01	2.20	1.75					14,610	
		1170	2	34	2.0	4.4	42.3	47.2	6.1	5.8	70.1	1.5	13.2	3.3	0.01	1.68	1.59	3.0	2020	2110	2200	12,990	79
			3				44.2	49.4	6.4	5.6	73.3	1.6	9.7	3.5	0.01	1.76	1.66					13,580	
			4				47.3	52.7		5.9	78.3	1.7	10.4	3.7	0.01	1.88	1.78					14,510	
		1176	2	35	3.4	6.2	42.4	46.2	5.2	6.1	70.6	1.4	13.1	3.6	0.02	1.99	1.57	3.0	1960	2050	2140	12,900	79
			3				45.2	49.3	5.5	5.8	75.3	1.5	8.1	3.8	0.02	2.12	1.67					13,750	
			4				47.9	52.1		6.1	79.7	1.6	8.6	4.1	0.02	2.25	1.77					14,560	
	Lower Freeport (No. 6A)	1172	2	33	1.6	2.9	12.3	7.6	77.2	1.8	11.0	0.3	5.1	4.5	0.03	4.50	0.01	0.0	2200	2290	2380	2,050	79
			3				12.7	7.8	79.5	1.5	11.3	0.3	2.6	4.6	0.03	4.63	0.01					2,110	
			4				61.8	38.2		7.4	55.3	1.5	12.7	22.6	0.15	22.61	0.05					10,290	
	Upper Freeport (No. 7)	1169	2	16	3.6	7.6	35.9	50.9	5.6	5.7	68.6	1.6	17.4	1.1	0.01	0.47	0.60	1.0	2060	2150	2290	12,190	79
			3				38.9	55.1	6.1	5.3	74.2	1.7	11.5	1.2	0.01	0.51	0.65					13,190	
			4				41.4	58.6		5.6	79.0	1.8	12.3	1.3	0.01	0.54	0.69					14,040	
		1173	2	16	3.7	6.8	32.2	47.8	13.2	5.1	63.4	1.5	15.5	1.3	0.01	1.21	0.04	1.5	2500	2580	2650	11,410	79
			3				34.5	51.3	14.2	4.7	68.0	1.6	10.1	1.4	0.01	1.30	0.04					12,240	
			4				40.2	59.7		5.4	79.2	1.9	11.8	1.6	0.01	1.51	0.05					14,260	
Sandy	Strasburg (No. 5A)	1204	2	15	2.4	5.4	41.5	41.1	12.0	5.5	64.0	1.4	15.7	1.5	0.02	0.72	0.72	1.0	2610	2690	2780	11,540	79
			3				43.9	43.4	12.7	5.2	67.7	1.5	11.5	1.6	0.02	0.76	0.76					12,190	
			4				50.2	49.8		5.9	77.5	1.7	13.2	1.8	0.02	0.87	0.87					13,960	

	Middle Kittanning (No. 6)	1203	2	39	2.4	5.2	38.5	46.8	9.5	5.2	65.8	1.3	13.3	4.9	0.13	3.93	0.84	4.0	1920	1990	2080	12,180	79
			3				40.6	49.4	10.0	4.9	69.4	1.4	9.2	5.2	0.14	4.15	0.89					12,850	
			4				45.1	54.9		5.4	77.1	1.5	10.2	5.7	0.15	4.61	0.98					14,280	
Sugar Creek	Tionesta (No. 3B)	1201	2	26	2.2	4.9	43.0	45.3	6.8	5.7	70.5	1.4	12.9	2.6	0.03	1.62	0.98	4.0	2110	2230	2370	12,850	79
			3				45.2	47.6	7.2	5.4	74.1	1.5	9.0	2.7	0.03	1.70	1.03					13,510	
			4				48.7	51.3		5.8	79.8	1.6	9.7	2.9	0.03	1.83	1.11					14,550	
		1201-1	2	18	1.8	4.5	36.9	42.2	16.4	5.0	61.6	1.3	12.1	3.5	0.04	2.61	0.86	1.5	2070	2160	2250	11,220	79
			3				38.6	44.2	17.2	4.7	64.5	1.4	8.5	3.7	0.04	2.73	0.90					11,740	
			4				46.6	53.4		5.7	77.9	1.6	10.2	4.4	0.05	3.30	1.09					14,180	
		1227	2	32	1.2	2.9	44.6	44.3	8.2	5.6	69.6	1.6	10.3	4.7	0.01	3.54	1.17	4.0	2030	2120	2250	12,970	79
			3				45.9	45.6	8.4	5.4	71.7	1.6	8.0	4.8	0.01	3.65	1.20					13,360	
			4				50.2	49.8		5.9	78.3	1.8	8.7	5.3	0.01	3.98	1.32					14,590	
		1227-1	2	17	2.2	4.1	40.7	42.3	12.9	5.2	64.3	1.5	11.1	5.1	0.01	3.11	1.96	3.5	2000	2080	2170	11,900	79
			3				42.4	44.1	13.5	4.9	67.0	1.6	7.8	5.3	0.01	3.24	2.04					12,410	
			4				49.0	51.0		5.7	77.5	1.8	9.0	6.1	0.01	3.75	2.36					14,340	
	Brookville (No. 4)	1200	2	13	2.8	6.2	36.0	47.3	10.5	5.3	65.5	1.4	15.5	1.8	0.03	0.89	0.87	1.5	2150	2300	2390	11,750	79
			3				38.4	50.4	11.2	4.9	69.8	1.5	10.6	1.9	0.03	0.95	0.93					12,530	
			4				43.2	56.8		5.5	78.6	1.7	12.0	2.2	0.04	1.07	1.04					14,100	
		1226	2	9	8.1	10.9	36.6	45.9	6.6	5.7	64.8	1.5	20.0	1.5	0.01	0.21	1.32	1.0	2390	2470	2580	11,390	79
			3				41.1	51.5	7.4	5.0	72.7	1.7	11.6	1.7	0.01	0.24	1.48					12,780	
			4				44.4	55.6		5.4	78.5	1.8	12.5	1.8	0.01	0.25	1.60					13,810	
	Lower Kittanning (No. 5)	1225	2	38	3.0	5.1	40.3	51.1	3.5	5.5	71.6	1.6	15.4	2.5	0.01	0.73	1.73	2.0	1920	2010	2090	12,740	79
			3				42.5	53.8	3.7	5.2	75.4	1.7	11.5	2.6	0.01	0.77	1.82					13,430	
			4				44.1	55.9		5.4	78.3	1.8	11.9	2.7	0.01	0.80	1.89					13,940	
Warren		1251	2	23	1.1	2.9	39.7	48.0	9.4	5.3	70.1	1.7	11.2	2.3	0.02	0.94	1.31	5.0	2510	2600	2720	12,790	79
			3				40.9	49.4	9.7	5.1	72.2	1.8	8.9	2.4	0.02	0.97	1.35					13,180	
			4				45.3	54.7		5.7	79.9	1.9	9.8	2.6	0.02	1.07	1.49					14,590	
	Middle Kittanning (No. 6)	1230	2	31	1.5	3.1	36.9	48.0	12.0	5.1	68.0	1.4	10.3	3.2	0.01	1.83	1.31	3.5	2140	2300	2410	12,330	79
			3				38.1	49.5	12.4	4.9	70.2	1.4	7.8	3.3	0.01	1.89	1.35					12,720	
			4				43.5	56.5		5.6	80.1	1.6	8.9	3.8	0.01	2.16	1.54					14,520	
Warwick		1175	2	40	2.3	4.2	41.2	46.9	7.7	5.5	68.9	1.4	11.8	4.7	0.12	3.19	1.36	7.5	2040	2130	2210	12,650	79
			3				43.0	49.0	8.0	5.3	71.9	1.5	8.4	4.9	0.13	3.33	1.42					13,200	
			4				46.8	53.2		5.7	78.2	1.6	9.2	5.3	0.14	3.62	1.54					14,360	
		1184	2	42	2.6	5.1	41.4	48.9	4.6	5.6	71.6	1.4	14.2	2.6	0.01	1.09	1.48	4.0	2000	2120	2260	12,950	79
			3				43.6	51.5	4.8	5.3	75.4	1.5	10.2	2.7	0.01	1.15	1.56					13,640	
			4				45.8	54.2		5.6	79.3	1.6	10.7	2.9	0.01	1.21	1.64					14,340	
Wayne	Brookville (No. 4)	1192	2	19	2.5	5.3	38.7	43.2	12.8	5.1	64.6	1.3	12.8	3.3	0.04	1.62	1.67	3.0	2020	2120	2200	11,710	79
			3				40.9	45.6	13.5	4.8	68.2	1.4	8.5	3.5	0.04	1.71	1.76					12,360	
			4				47.3	52.7		5.5	78.9	1.6	9.9	4.0	0.05	1.98	2.04					14,290	
	Lower Kittanning (No. 5)	1189	2	31	2.2	4.9	40.1	45.8	9.2	5.4	66.3	1.3	12.1	5.7	0.04	3.94	1.67	4.0	2010	2100	2190	12,230	79
			3				42.2	48.2	9.7	5.1	69.7	1.4	8.1	6.0	0.04	4.14	1.76					12,860	
			4				46.7	53.3		5.7	77.2	1.5	9.0	6.6	0.05	4.59	1.94					14,240	
York	Middle Kittanning (No. 6)	1177	2	32	2.8	5.6	41.8	48.7	3.9	5.6	69.7	1.4	16.9	2.4	0.02	0.86	1.53	3.5	2070	2160	2270	12,910	79
			3				44.3	51.6	4.1	5.3	73.8	1.5	12.6	2.5	0.02	0.91	1.62					13,670	
			4				46.2	53.8		5.5	77.0	1.5	13.2	2.7	0.02	0.95	1.69					14,260	
VINTON COUNTY																							
Madison	Clarion (No. 4A)	1154	2	33	3.3	6.2	41.7	45.0	7.1	5.8	68.0	1.4	14.7	3.1	0.01	2.02	1.06	4.0	2150	2240	2340	12,450	79
			3				44.5	48.0	7.6	5.4	72.5	1.5	9.8	3.3	0.01	2.15	1.13					13,270	
			4				48.1	51.9		5.9	78.4	1.6	10.6	3.6	0.01	2.33	1.22					14,360	
		1154-1	2	8	2.3	4.5	33.6	40.4	21.5	4.8	57.3	1.2	12.6	2.5	0.01	1.99	0.53	1.0	2790	2800	2800	10,400	79
			3				35.2	42.3	22.5	4.5	60.0	1.3	9.0	2.6	0.01	2.08	0.55					10,890	
			4				45.4	54.6		5.8	77.4	1.6	11.6	3.4	0.01	2.69	0.72					14,050	
	Scrubgrass	1155	2	17	2.8	5.6	40.5	39.1	14.8	5.5	61.8	1.3	12.6	4.0	0.02	3.15	0.85	4.5	2100	2200	2320	11,330	79
			3				42.9	41.4	15.7	5.2	65.5	1.4	8.1	4.2	0.02	3.34	0.90					12,000	
			4				50.9	49.1		6.1	77.6	1.6	9.6	5.0	0.03	3.96	1.07					14,230	

Township	Seam	DGS file no.	Condition	Analyzed thickness (nearest in)	Air-dried loss (%)	Proximate analysis (%)				Ultimate analysis (%)					Forms of sulfur (%)			Free-swelling index	Fusibility of ash (°F)			Heating value (Btu/lb)	Year
						Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Total sulfur	Sulfate	Pyritic	Organic		Initial deformation temperature	Softening temperature	Fluid temperature		
VINTON COUNTY (continued)																							
Richland	Brookville (No. 4)	1145	2	38	5.3	8.6	40.5	44.1	6.8	5.9	64.8	1.5	17.2	3.9	0.04	2.25	1.61	1.5	1920	2010	2100	11,800	79
			3				44.3	48.2	7.4	5.4	70.9	1.6	10.5	4.3	0.04	2.46	1.76					12,910	
			4				47.9	52.1		5.8	76.6	1.8	11.3	4.6	0.05	2.66	1.90					13,950	
		1145-1	2	19	6.1	9.1	32.4	41.8	16.7	5.2	58.9	1.2	16.4	1.6	0.02	0.69	0.85	1.0	2510	2610	2700	10,400	79
			3				35.6	46.0	18.4	4.6	64.8	1.3	9.1	1.8	0.02	0.76	0.94					11,440	
			4				43.7	56.3		5.6	79.4	1.6	11.2	2.2	0.03	0.93	1.15					14,010	
Swan	Clarion (No. 4A)	1149	2	32	3.3	6.1	43.3	41.8	8.8	5.8	66.2	1.4	14.1	3.7	0.01	2.27	1.39	3.5	2060	2210	2320	12,190	79
			3				46.1	44.5	9.4	5.5	70.5	1.5	9.2	3.9	0.01	2.42	1.48					12,990	
			4				50.9	49.1		6.0	77.8	1.6	10.2	4.3	0.01	2.67	1.63					14,330	
WAYNE COUNTY																							
Paint	Tionesta (No. 3B)	1243	2	26	2.4	5.0	38.2	50.2	6.6	5.5	70.8	1.9	14.0	1.2	0.01	0.93	0.25	1.5	2580	2740	2800	12,760	79
			3				40.2	52.8	6.9	5.2	74.5	2.0	10.1	1.3	0.01	0.98	0.26					13,430	
			4				43.2	56.8		5.6	80.1	2.1	10.8	1.4	0.01	1.05	0.28					14,430	
		1243-1	2	11	3.4	5.8	34.8	39.4	20.0	5.0	58.5	1.6	13.1	1.8	0.01	1.61	0.21	3.0	2570	2660	2780	10,570	79
			3				36.9	41.8	21.2	4.6	62.1	1.7	8.4	1.9	0.01	1.71	0.22					11,220	
			4				46.9	53.1		5.9	78.8	2.2	10.7	2.4	0.01	2.17	0.28					14,240	
Salt Creek	Brookville (No. 4)	1224	2	30	1.0	2.6	44.4	43.8	9.2	5.4	69.3	1.5	11.0	3.6	0.01	1.75	1.81	4.5	2180	2340	2420	12,700	79
			3				45.6	45.0	9.4	5.2	71.1	1.5	8.9	3.7	0.01	1.80	1.86					13,040	
			4				50.3	49.7		5.8	78.6	1.7	9.9	4.1	0.01	1.98	2.05					14,400	

TABLE 2.—*Proximate-ultimate coal analyses by bed*

Key to symbols by column:

DGS file no.:

4-digit number - production bench or whole-bed channel sample; taken in conformity with Holmes, 1911; Fieldner and Selvig, 1938

-1, -2 - samples taken in benches or from roof or floor coal

Condition:

2 - as received

3 - moisture-free

4 - moisture- and ash-free

Analyzed thickness (these footnotes apply only to table 2):

[1] - lower bench, good coal

[2] - upper bench, poor coal

[3] - 1137 - lower bench, 1138 - upper bench at same site

[4] - lower bench

[5] - upper bench

1979 analyses from U.S. Department of Energy; 1980 analyses from a commercial testing laboratory.

County	Township	DGS file no.	Condition	Analyzed thickness (nearest in)	Air-dried loss (%)	Proximate analysis (%)				Ultimate analysis (%)					Forms of sulfur (%)			Free-swelling index	Fusibility of ash (°F)			Heating value (Btu/lb)	Year
						Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Total sulfur	Sulfate	Pyritic	Organic		Initial deformation temperature	Softening temperature	Fluid temperature		
SHARON (NO. 1) COAL																							
Jackson	Liberty	1134	2	26	3.6	8.4	38.4	40.3	12.9	5.6	62.2	1.5	17.0	0.9	0.01	0.61	0.25	1.0	2800	2800	2800	11,220	79
			3				41.9	44.0	14.1	5.1	67.9	1.6	10.4	1.0	0.01	0.67	0.27					12,250	
			4				48.8	51.2		5.9	79.0	1.9	12.1	1.1	0.01	0.78	0.32					14,260	
		1135	2	25	4.0	9.6	30.4	39.1	20.9	5.0	53.4	1.2	19.0	0.5	0.01	0.31	0.22	0.0	2800	2800	2800	9,470	79
			3				33.6	43.3	23.1	4.4	59.1	1.3	11.6	0.6	0.01	0.34	0.24					10,480	
			4				43.7	56.3		5.7	76.8	1.7	15.1	0.7	0.01	0.45	0.32					13,630	
Pike	Marion	1136	2	22	5.5	9.0	31.2	46.1	13.7	5.5	60.5	1.3	18.4	0.6	0.01	0.41	0.18	1.0	2800	2800	2800	10,590	79
			3				34.3	50.7	15.1	4.9	66.5	1.4	11.4	0.7	0.01	0.45	0.20					11,640	
			4				40.4	59.6		5.8	78.3	1.7	13.5	0.8	0.01	0.53	0.23					13,700	
QUAKERTOWN (NO. 2) COAL																							
Licking	Bowling Green	1253	2	25	5.3	6.3	32.2	50.6	10.9	5.1	66.0	1.5	15.3	1.3	0.11	1.07	0.10	2.0	2650	2770	2800	11,650	80
			3				34.3	54.0	11.7	4.7	70.4	1.6	10.4	1.4	0.12	1.14	0.11					12,430	
			4				38.8	61.2		5.3	79.7	1.8	11.7	1.5	0.13	1.29	0.12					14,070	
BEAR RUN COAL																							
Licking	Bowling Green	1254	2	16	1.5	2.5	28.7	38.9	29.9	3.8	53.7	1.0	9.7	1.8	0.14	0.61	1.09	1.0	2650	2780	2800	9,460	80
			3				29.4	39.9	30.7	3.6	55.1	1.1	7.6	1.9	0.14	0.63	1.12					9,710	
			4				42.5	57.5		5.2	79.5	1.5	11.0	2.7	0.21	0.90	1.61					14,010	
LOWER MERCER (NO. 3) COAL																							
Stark	Sugar Creek	1217	2	22	1.9	3.9	38.5	49.7	7.9	5.4	71.3	1.6	12.3	1.4	0.01	0.82	0.55	2.5	2700	2790	2800	12,730	79
			3				40.1	51.7	8.2	5.2	74.2	1.7	9.2	1.5	0.01	0.85	0.57					13,250	
			4				43.7	56.3		5.6	80.8	1.8	10.0	1.6	0.01	0.93	0.62					14,430	
		1217-1	2	7	4.6	6.2	25.2	32.2	36.4	4.0	43.9	1.1	12.9	1.8	0.01	1.40	0.40	1.0	2760	2800	2800	7,800	79
			3				26.9	34.3	38.8	3.5	46.8	1.2	7.9	1.9	0.01	1.49	0.43					8,320	
			4				43.9	56.1		5.8	76.5	1.9	12.9	3.1	0.02	2.44	0.70					13,590	
BEDFORD COAL																							
Stark	Sugar Creek	1218	2	18	3.7	5.7	30.8	38.8	24.7	4.4	51.9	1.2	13.8	4.0	0.01	3.51	0.45	1.5	2530	2610	2690	9,410	79
			3				32.7	41.1	26.2	4.0	55.0	1.3	9.3	4.2	0.01	3.72	0.48					9,980	
			4				44.3	55.7		5.4	74.6	1.7	12.5	5.7	0.01	5.04	0.65					13,520	
TIONESTA (NO. 3B) COAL																							
Stark	Bethlehem	1238	2	40	1.2	3.5	39.3	44.5	12.7	5.2	65.6	1.7	10.0	4.8	0.01	3.65	1.14	4.0	1970	2040	2100	12,050	79
			3				40.7	46.1	13.2	5.0	68.0	1.8	7.1	5.0	0.01	3.78	1.18					12,490	
			4				46.9	53.1		5.7	78.3	2.0	8.2	5.7	0.01	4.36	1.36					14,380	
	Sugar Creek	1219	2	11	0.9	2.0	34.7	30.9	32.4	4.1	45.6	1.1	6.2	10.6	0.01	8.67	1.88	2.5	2060	2140	2220	8,780	79
			3				35.4	31.5	33.1	4.0	46.5	1.1	4.5	10.8	0.01	8.85	1.92					8,960	
			4				52.9	47.1		5.9	69.5	1.7	6.7	16.2	0.02	13.22	2.87					13,390	
Tuscarawas	Sugar Creek	1201	2	26	2.2	4.9	43.0	45.3	6.8	5.7	70.5	1.4	12.9	2.6	0.03	1.62	0.98	4.0	2110	2230	2370	12,850	79
			3				45.2	47.6	7.2	5.4	74.1	1.5	9.0	2.7	0.03	1.70	1.03					13,510	
			4				48.7	51.3		5.8	79.8	1.6	9.7	2.9	0.03	1.83	1.11					14,550	
		1201-1	2	18	1.8	4.5	36.9	42.2	16.4	5.0	61.6	1.3	12.1	3.5	0.04	2.61	0.86	1.5	2070	2160	2250	11,220	79
			3				38.6	44.2	17.2	4.7	64.5	1.4	8.5	3.7	0.04	2.73	0.90					11,740	
			4				46.6	53.4		5.7	77.9	1.6	10.2	4.4	0.05	3.30	1.09					14,180	
		1227	2	32	1.2	2.9	44.6	44.3	8.2	5.6	69.6	1.6	10.3	4.7	0.01	3.54	1.17	4.0	2030	2120	2250	12,970	79
			3				45.9	45.6	8.4	5.4	71.7	1.6	8.0	4.8	0.01	3.65	1.20					13,360	
			4				50.2	49.8		5.9	78.3	1.8	8.7	5.3	0.01	3.98	1.32					14,590	
		1227-1	2	17	2.2	4.1	40.7	42.3	12.9	5.2	64.3	1.5	11.1	5.1	0.01	3.11	1.96	3.5	2000	2080	2170	11,900	79
			3				42.4	44.1	13.5	4.9	67.0	1.6	7.8	5.3	0.01	3.24	2.04					12,410	
			4				49.0	51.0		5.7	77.5	1.8	9.0	6.1	0.01	3.75	2.36					14,340	
Wayne	Paint	1243	2	26	2.4	5.0	38.2	50.2	6.6	5.5	70.8	1.9	14.0	1.2	0.01	0.93	0.25	1.5	2580	2740	2800	12,760	79
			3				40.2	52.8	6.9	5.2	74.5	2.0	10.1	1.3	0.01	0.98	0.26					13,430	
			4				43.2	56.8		5.6	80.1	2.1	10.8	1.4	0.01	1.05	0.28					14,430	

		1243-1	2	11	3.4	5.8	34.8	39.4	20.0	5.0	58.5	1.6	13.1	1.8	0.01	1.61	0.21	3.0	2570	2660	2780	10,570	79
			3				36.9	41.8	21.2	4.6	62.1	1.7	8.4	1.9	0.01	1.71	0.22					11,220	
			4				46.9	53.1		5.9	78.8	2.2	10.7	2.4	0.01	2.17	0.28					14,240	
BROOKVILLE (NO. 4) COAL																							
Holmes	Clark	1214	2	20	1.3	3.0	38.8	44.9	13.3	5.2	66.4	1.5	11.2	2.3	0.01	1.08	1.25	2.0	2640	2720	2790	11,980	79
			3				40.0	46.3	13.7	5.0	68.5	1.5	8.8	2.4	0.01	1.11	1.29					12,350	
			4				46.4	53.6		5.8	79.3	1.8	10.2	2.7	0.01	1.29	1.49					14,320	
	Hardy	1231	2	18	1.2	3.3	47.1	42.4	7.2	5.9	70.4	1.7	12.0	3.0	0.01	0.95	2.01	4.0	2580	2670	2750	12,970	79
			3				48.7	43.8	7.4	5.7	72.8	1.8	9.4	3.1	0.01	0.98	2.08					13,410	
			4				52.6	47.4		6.2	78.7	1.9	10.1	3.4	0.01	1.06	2.25					14,490	
		1239	2	18	1.6	3.4	42.8	46.1	7.7	5.6	69.9	1.6	12.8	2.4	0.02	0.51	1.83	3.0	2550	2620	2700	12,570	79
			3				44.3	47.7	8.0	5.4	72.4	1.7	10.1	2.5	0.02	0.53	1.89					13,010	
			4				48.1	51.9		5.9	78.6	1.8	11.0	2.7	0.02	0.57	2.06					14,140	
	Salt Creek	1215	2	28	1.2	2.9	42.0	44.5	10.6	5.4	68.4	1.4	11.1	3.1	0.01	1.48	1.64	3.0	2410	2500	2580	12,440	79
			3				43.3	45.8	10.9	5.2	70.4	1.4	8.8	3.2	0.01	1.52	1.69					12,810	
			4				48.6	51.4		5.9	79.1	1.6	9.9	3.6	0.01	1.71	1.90					14,380	
Stark	Bethlehem	1237	2	22	1.0	3.2	41.6	47.9	7.3	5.4	70.3	1.7	12.5	2.8	0.02	1.34	1.49	2.5	1970	2140	2270	12,730	79
			3				43.0	49.5	7.5	5.2	72.6	1.8	10.0	2.9	0.02	1.38	1.54					13,150	
			4				46.5	53.5		5.6	78.5	1.9	10.8	3.1	0.02	1.50	1.66					14,230	
	Sugar Creek	1220	2	24	1.3	3.1	43.5	49.2	4.2	5.6	73.9	1.6	11.7	3.1	0.01	1.51	1.54	5.5	1950	2040	2150	13,400	79
			3				44.9	50.8	4.3	5.4	76.3	1.7	9.2	3.2	0.01	1.56	1.59					13,830	
			4				46.9	53.1		5.7	79.7	1.7	9.6	3.3	0.01	1.63	1.66					14,460	
		1220-1	2	14	1.1	2.6	40.0	42.0	15.4	5.0	62.8	1.4	10.9	4.4	0.01	2.77	1.67	4.5	2520	2610	2720	11,510	79
			3				41.1	43.1	15.8	4.8	64.5	1.4	8.8	4.5	0.01	2.84	1.71					11,810	
			4				48.8	51.2		5.7	76.6	1.7	10.5	5.4	0.01	3.38	2.04					14,030	
Tuscarawas	Dover	1130	2	19	3.0	5.4	37.6	43.2	13.8	5.4	64.6	1.3	12.2	2.7	0.03	1.44	1.23	5.0	2000	2110	2200	11,610	79
			3				39.7	45.7	14.6	5.1	68.3	1.4	7.8	2.9	0.03	1.52	1.30					12,280	
			4				46.5	53.5		5.9	80.0	1.6	9.2	3.3	0.04	1.78	1.52					14,370	
	Sugar Creek	1200	2	13	2.8	6.2	36.0	47.3	10.5	5.3	65.5	1.4	15.5	1.8	0.03	0.89	0.87	1.5	2150	2300	2390	11,750	79
			3				38.4	50.4	11.2	4.9	69.8	1.5	10.6	1.9	0.03	0.95	0.93					12,530	
			4				43.2	56.8		5.5	78.6	1.7	12.0	2.2	0.04	1.07	1.04					14,100	
		1226	2	9	8.1	10.9	36.6	45.9	6.6	5.7	64.8	1.5	20.0	1.5	0.01	0.21	1.32	1.0	2390	2470	2580	11,390	79
			3				41.1	51.5	7.4	5.0	72.7	1.7	11.6	1.7	0.01	0.24	1.48					12,780	
			4				44.4	55.6		5.4	78.5	1.8	12.5	1.8	0.01	0.25	1.60					13,810	
	Wayne	1192	2	19	2.5	5.3	38.7	43.2	12.8	5.1	64.6	1.3	12.8	3.3	0.04	1.62	1.67	3.0	2020	2120	2200	11,710	79
			3				40.9	45.6	13.5	4.8	68.2	1.4	8.5	3.5	0.04	1.71	1.76					12,360	
			4				47.3	52.7		5.5	78.9	1.6	9.9	4.0	0.05	1.98	2.04					14,290	
Vinton	Richland	1145	2	38	5.3	8.6	40.5	44.1	6.8	5.9	64.8	1.5	17.2	3.9	0.04	2.25	1.61	1.5	1920	2010	2100	11,800	79
			3				44.3	48.2	7.4	5.4	70.9	1.6	10.5	4.3	0.04	2.46	1.76					12,910	
			4				47.9	52.1		5.8	76.6	1.8	11.3	4.6	0.05	2.66	1.90					13,950	
		1145-1	2	19	6.1	9.1	32.4	41.8	16.7	5.2	58.9	1.2	16.4	1.6	0.02	0.69	0.85	1.0	2510	2620	2700	10,400	79
			3				35.6	46.0	18.4	4.6	64.8	1.3	9.1	1.8	0.02	0.76	0.94					11,440	
			4				43.7	56.3		5.6	79.4	1.6	11.2	2.2	0.03	0.93	1.15					14,010	
Wayne	Salt Creek	1224	2	30	1.0	2.6	44.4	43.8	9.2	5.4	69.3	1.5	11.0	3.6	0.01	1.75	1.81	4.5	2180	2340	2420	12,700	79
			3				45.6	45.0	9.4	5.2	71.1	1.5	8.9	3.7	0.01	1.80	1.86					13,040	
			4				50.3	49.7		5.8	78.6	1.7	9.9	4.1	0.01	1.98	2.05					14,400	
CLARION (NO. 4A) COAL																							
Hocking	Washington	1150	2	15	3.8	6.9	41.7	47.2	4.2	5.9	70.6	1.3	16.1	2.0	0.01	0.74	1.29	3.0	2300	2390	2520	12,820	79
			3				44.8	50.7	4.5	5.5	75.8	1.4	10.7	2.1	0.01	0.79	1.39					13,770	
			4				46.9	53.1		5.8	79.4	1.5	11.2	2.2	0.01	0.83	1.45					14,420	
Jackson	Milton	1148	2	33	3.9	7.8	42.8	43.6	5.8	6.2	66.8	1.3	16.7	3.2	0.01	1.52	1.69	4.0	1960	2050	2150	12,120	79
			3				46.4	47.3	6.3	5.8	72.5	1.4	10.6	3.5	0.01	1.65	1.83					13,150	
			4				49.5	50.5		6.2	77.3	1.5	11.3	3.7	0.01	1.76	1.96					14,030	

County	Township	DGS file no.	Condition	Analyzed thickness (nearest in)	Air-dried loss (%)	Proximate analysis (%)				Ultimate analysis (%)					Forms of sulfur (%)			Free-swelling index	Fusibility of ash (°F)			Heating value (Btu/lb)	Year
						Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Total sulfur	Sulfate	Pyritic	Organic		Initial deformation temperature	Softening temperature	Fluid temperature		
CLARION (NO. 4A) COAL (continued)																							
Jackson (continued)	Milton (continued)	1148-1	2	16	4.1	7.2	40.9	42.3	9.6	5.8	63.8	1.2	16.1	3.4	0.03	1.40	2.01	3.5	2190	2280	2400	11,620	79
			3				44.1	45.6	10.3	5.4	68.7	1.3	10.5	3.7	0.03	1.51	2.17					12,520	
			4				49.2	50.8		6.0	76.7	1.4	11.7	4.1	0.04	1.68	2.42					13,960	
Lawrence	Washington	1131	2	32	3.2	7.8	41.7	42.8	7.7	5.9	65.6	1.3	15.7	3.9	0.01	2.50	1.34	0.0	1910	2030	2110	11,950	79
			3				45.2	46.4	8.4	5.5	71.1	1.4	9.5	4.2	0.01	2.71	1.45					12,960	
			4				49.3	50.7		6.0	77.6	1.5	10.4	4.6	0.01	2.96	1.59					14,140	
Vinton	Madison	1154	2	33	3.3	6.2	41.7	45.0	7.1	5.8	68.0	1.4	14.7	3.1	0.01	2.02	1.06	4.0	2150	2240	2340	12,450	79
			3				44.5	48.0	7.6	5.4	72.5	1.5	9.8	3.3	0.01	2.15	1.13					13,270	
			4				48.1	51.9		5.9	78.4	1.6	10.6	3.6	0.01	2.33	1.22					14,360	
		1154-1	2	8	2.3	4.5	33.6	40.4	21.5	4.8	57.3	1.2	12.6	2.5	0.01	1.99	0.53	1.0	2790	2800	2800	10,400	79
			3				35.2	42.3	22.5	4.5	60.0	1.3	9.0	2.6	0.01	2.08	0.55					10,890	
			4				45.4	54.6		5.8	77.4	1.6	11.6	3.4	0.01	2.69	0.72					14,050	
	Swan	1149	2	32	3.3	6.1	43.3	41.8	8.8	5.8	66.2	1.4	14.1	3.7	0.01	2.27	1.39	3.5	2060	2210	2320	12,190	79
			3				46.1	44.5	9.4	5.5	70.5	1.5	9.2	3.9	0.01	2.42	1.48					12,990	
			4				50.9	49.1		6.0	77.8	1.6	10.2	4.3	0.01	2.67	1.63					14,330	
SCRUBGRASS COAL																							
Vinton	Madison	1155	2	17	2.8	5.6	40.5	39.1	14.8	5.5	61.8	1.3	12.6	4.0	0.02	3.15	0.85	4.5	2100	2200	2320	11,330	79
			3				42.9	41.4	15.7	5.2	65.5	1.4	8.1	4.2	0.02	3.34	0.90					12,000	
			4				50.9	49.1		6.1	77.6	1.6	9.6	5.0	0.03	3.96	1.07					14,230	
LOWER KITTANNING (NO. 5) COAL																							
Carroll	Rose	1246	2	29	1.0	2.9	40.4	45.6	11.1	5.4	68.8	1.7	9.4	3.5	0.01	2.21	1.33	4.0	2320	2430	2520	12,570	79
			3				41.6	47.0	11.4	5.2	70.9	1.8	7.0	3.6	0.01	2.28	1.37					12,940	
			4				47.0	53.0		5.9	80.0	2.0	7.9	4.1	0.01	2.57	1.55					14,610	
Coshocton	Adams	1255	2	30	3.8	5.2	37.1	52.3	5.5	5.4	70.1	1.4	16.0	1.7	0.03	0.14	1.53	1.5	2630	2730	2800	12,430	80
			3				39.1	55.1	5.8	5.1	73.9	1.5	12.0	1.8	0.03	0.15	1.61					13,110	
			4				41.5	58.5		5.4	78.4	1.6	12.7	1.9	0.03	0.16	1.71					13,910	
		1262	2	25	2.6	3.7	33.2	43.5	19.6	4.6	58.6	1.2	11.4	4.6	0.25	2.93	1.45	1.5	2150	2260	2420	10,630	80
			3				34.5	45.1	20.4	4.3	60.8	1.3	8.4	4.8	0.26	3.04	1.51					11,040	
			4				43.3	56.7		5.4	76.4	1.6	10.5	6.0	0.33	3.82	1.89					13,860	
	Keene	1161	2	39	2.7	5.5	39.0	44.1	11.4	5.5	64.2	1.3	13.2	4.3	0.01	2.86	1.46	3.5	2140	2270	2350	11,770	79
			3				41.3	46.7	12.1	5.2	67.9	1.4	8.8	4.6	0.01	3.03	1.54					12,450	
			4				46.9	53.1		5.9	77.3	1.6	10.0	5.2	0.01	3.44	1.76					14,160	
	Lafayette	1259	2	28	3.4	4.5	37.7	51.5	6.3	5.4	70.3	1.5	13.8	2.7	0.18	1.27	1.29	3.5	2100	2200	2380	12,650	80
			3				39.5	53.9	6.7	5.1	73.6	1.6	10.2	2.9	0.19	1.33	1.35					13,250	
			4				42.3	57.7		5.5	78.8	1.7	10.9	3.1	0.20	1.43	1.45					14,190	
	Oxford	1257	2	45	3.1	4.1	38.9	50.9	6.1	5.5	71.1	1.4	12.8	3.0	0.15	1.30	1.58	3.5	2040	2190	2330	12,770	80
			3				40.6	53.1	6.4	5.3	74.2	1.5	9.5	3.2	0.16	1.36	1.65					13,320	
			4				43.3	56.7		5.6	79.2	1.6	10.2	3.4	0.17	1.45	1.76					14,230	
		1261	2	26	2.8	3.8	40.7	49.0	6.4	5.4	70.5	1.4	12.4	3.8	0.39	1.56	1.85	4.0	2000	2070	2150	12,700	80
			3				42.3	51.0	6.7	5.2	73.3	1.4	9.4	4.0	0.41	1.62	1.92					13,200	
			4				45.4	54.6		5.6	78.6	1.5	10.1	4.2	0.43	1.74	2.06					14,150	
Holmes	Berlin	1212	2	36	1.9	4.0	41.3	47.4	7.3	5.5	70.3	1.6	12.1	3.3	0.01	1.98	1.35	4.0	2010	2100	2190	12,780	79
			3				43.0	49.4	7.6	5.3	73.2	1.7	8.9	3.4	0.01	2.06	1.41					13,310	
			4				46.6	53.4		5.7	79.3	1.8	9.6	3.7	0.01	2.23	1.52					14,400	
		1216	2	29	1.7	3.8	44.0	46.2	6.0	5.6	71.4	1.6	11.0	4.4	0.01	3.33	1.01	3.5	1890	1970	2060	13,060	79
			3				45.7	48.0	6.2	5.4	74.2	1.7	7.9	4.6	0.01	3.46	1.05					13,570	
			4				48.8	51.2		5.7	79.2	1.8	8.5	4.9	0.01	3.69	1.12					14,480	

	Hardy	1232	2	8[1]	2.1	4.3	46.6	39.3	9.8	5.8	66.1	1.7	10.7	5.9	0.01	4.09	1.84	4.0	2570	2650	2740	12,350	79
			3				48.7	41.1	10.2	5.6	69.1	1.8	7.2	6.2	0.01	4.27	1.92					12,910	
			4				54.2	45.8		6.2	76.9	2.0	8.0	6.9	0.01	4.76	2.14					14,380	
		1232-1	2	32[2]	3.3	4.8	23.1	22.1	50.0	3.4	33.2	1.0	9.9	2.6	0.02	1.58	0.98	0.0	2620	2730	2800	6,050	79
			3				24.3	23.2	52.5	3.0	34.9	1.1	5.9	2.7	0.02	1.66	1.03					6,350	
			4				51.1	48.9		6.3	73.5	2.2	12.5	5.8	0.04	3.50	2.17					13,380	
	Paint	1223	2	19	2.3	4.3	40.6	48.2	6.9	5.5	70.8	1.6	12.8	2.5	0.01	1.18	1.33	4.5	2040	2120	2210	12,760	79
			3				42.4	50.4	7.2	5.2	74.0	1.7	9.4	2.6	0.01	1.23	1.39					13,330	
			4				45.7	54.3		5.7	79.7	1.8	10.1	2.8	0.01	1.33	1.50					14,370	
	Walnut Creek	1213	2	38	1.6	3.5	41.1	47.2	8.2	5.4	69.0	1.5	11.2	4.8	0.01	3.82	1.03	3.0	2030	2110	2200	12,690	79
			3				42.6	48.9	8.5	5.2	71.5	1.6	8.4	5.0	0.01	3.96	1.07					13,150	
			4				46.5	53.5		5.7	78.1	1.7	9.2	5.4	0.01	4.33	1.17					14,370	
Jackson	Bloomfield	1144	2	36	4.6	7.8	37.4	45.7	9.1	5.5	64.3	1.4	15.8	3.8	0.02	2.84	0.97	3.0	1980	2070	2230	11,640	79
			3				40.6	49.6	9.9	5.0	69.7	1.5	9.6	4.1	0.02	3.08	1.05					12,620	
			4				45.0	55.0		5.6	77.4	1.7	10.7	4.6	0.02	3.42	1.17					14,000	
	Madison	1268	2	18	3.2	4.3	36.4	46.5	12.8	4.9	63.8	1.3	12.9	4.3	0.26	2.48	1.59	1.5	2080	2160	2340	11,450	80
			3				38.0	48.6	13.4	4.6	66.7	1.3	9.4	4.5	0.27	2.59	1.66					11,970	
			4				43.9	56.1		5.4	77.0	1.5	10.9	5.2	0.31	2.99	1.92					13,820	
	Milton	1258	2	30	4.8	6.1	34.5	46.2	13.2	4.9	63.0	1.3	16.8	0.8	0.08	0.17	0.57	0.5	2750	2800	2800	11,000	80
			3				36.8	49.2	14.0	4.5	67.1	1.3	12.1	0.9	0.09	0.18	0.61					11,720	
			4				42.8	57.2		5.2	78.1	1.6	14.1	1.0	0.10	0.21	0.71					13,630	
Lawrence	Decatur	1133	2	39	6.3	9.6	35.7	48.1	6.6	5.8	66.2	1.4	18.7	1.3	0.01	0.65	0.66	3.5	2580	2660	2780	11,780	79
			3				39.5	53.2	7.3	5.2	73.2	1.5	11.2	1.4	0.01	0.72	0.73					13,030	
			4				42.6	57.4		5.6	79.0	1.7	12.1	1.6	0.01	0.78	0.79					14,060	
	Washington	1132	2	25	6.3	9.5	34.9	45.0	10.6	5.6	62.1	1.3	17.7	2.6	0.01	1.83	0.75	1.0	1980	2080	2170	11,020	79
			3				38.6	49.7	11.7	5.0	68.6	1.4	10.2	2.9	0.01	2.02	0.83					12,180	
			4				43.7	56.3		5.7	77.7	1.6	11.6	3.3	0.01	2.29	0.94					13,790	
Mahoning	Springfield	1210	2	35	1.0	2.5	36.7	55.7	5.1	5.5	77.3	1.8	9.6	0.7	0.01	0.10	0.60	6.5	2800	2800	2800	13,740	79
			3				37.6	57.1	5.2	5.4	79.3	1.8	7.6	0.7	0.01	0.10	0.62					14,090	
			4				39.7	60.3		5.7	83.7	1.9	8.0	0.8	0.01	0.11	0.65					14,870	
Stark	Paris	1211	2	35	1.0	2.6	42.3	47.4	7.7	5.3	70.6	1.5	9.1	5.8	0.01	4.31	1.49	3.5	1960	2070	2160	13,090	79
			3				43.4	48.7	7.9	5.1	72.5	1.5	7.0	6.0	0.01	4.43	1.53					13,440	
			4				47.2	52.8		5.6	78.7	1.7	7.6	6.5	0.01	4.80	1.66					14,590	
		1248	2	22	0.8	2.7	41.8	48.4	7.1	5.4	71.3	1.7	9.3	5.2	0.01	4.09	1.05	4.5	1960	2020	2070	13,100	79
			3				43.0	49.7	7.3	5.2	73.3	1.7	7.1	5.3	0.01	4.20	1.08					13,460	
			4				46.3	53.7		5.7	79.0	1.9	7.6	5.8	0.01	4.53	1.16					14,520	
Tuscarawas	Bucks	1180	2	21	2.3	5.5	41.1	48.4	5.0	5.5	71.0	1.4	14.2	2.9	0.03	1.73	1.15	3.0	1970	2080	2160	12,780	79
			3				43.5	51.2	5.3	5.2	75.1	1.5	9.9	3.1	0.03	1.83	1.22					13,530	
			4				45.9	54.1		5.5	79.3	1.6	10.4	3.2	0.03	1.93	1.28					14,280	
		1185	2	24	2.7	5.4	40.6	48.0	6.0	5.5	70.2	1.5	13.5	3.4	0.03	1.81	1.52	4.5	2090	2210	2320	12,760	79
			3				42.9	50.7	6.3	5.2	74.2	1.6	9.2	3.6	0.03	1.91	1.61					13,490	
			4				45.8	54.2		5.5	79.2	1.7	9.8	3.8	0.03	2.04	1.72					14,400	
	Dover	1129	2	36	3.6	6.5	39.7	47.5	6.3	5.7	68.6	1.4	13.8	4.1	0.01	2.44	1.68	5.5	1960	2040	2160	12,440	79
			3				42.5	50.8	6.7	5.3	73.4	1.5	8.6	4.4	0.01	2.61	1.80					13,300	
			4				45.5	54.5		5.7	78.7	1.6	9.2	4.7	0.01	2.80	1.93					14,260	
		1196	2	43	3.4	6.6	38.4	49.0	6.0	5.6	69.7	1.4	14.0	3.4	0.02	1.86	1.52	3.5	1850	1970	2060	12,580	79
			3				41.1	52.5	6.4	5.2	74.6	1.5	8.7	3.6	0.02	1.99	1.63					13,470	
			4				43.9	56.1		5.6	79.7	1.6	9.3	3.9	0.02	2.13	1.74					14,390	
		1229	2	50	2.8	5.2	40.3	45.6	8.9	5.4	67.4	1.4	12.2	4.8	0.01	2.84	1.98	5.0	1930	2070	2150	12,390	79
			3				42.5	48.1	9.4	5.1	71.1	1.5	8.0	5.1	0.01	3.00	2.09					13,070	
			4				46.9	53.1		5.6	78.5	1.6	8.8	5.6	0.01	3.31	2.31					14,430	
	Fairfield	1188	2	26	2.1	4.8	39.5	46.6	9.1	5.3	68.1	1.4	12.3	3.8	0.02	2.36	1.43	4.5	2070	2200	2330	12,410	79
			3				41.5	48.9	9.6	5.0	71.5	1.5	8.4	4.0	0.02	2.48	1.50					13,040	
			4				45.9	54.1		5.5	79.1	1.6	9.3	4.4	0.02	2.74	1.66					14,420	
	Franklin	1193	2	31	2.0	4.7	41.6	42.5	11.2	5.5	65.0	1.3	10.5	6.6	0.19	4.66	1.79	3.5	1910	2040	2130	12,010	79
			3				43.7	44.6	11.8	5.2	68.2	1.4	6.6	6.9	0.20	4.89	1.88					12,600	
			4				49.5	50.5		5.9	77.3	1.5	7.5	7.8	0.23	5.54	2.13					14,280	

County	Township	DGS file no.	Condition	Analyzed thickness (nearest in)	Air-dried loss (%)	Proximate analysis (%)				Ultimate analysis (%)					Forms of sulfur (%)			Free-swelling index	Fusibility of ash (°F)			Heating value (Btu/lb)	Year
						Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Total sulfur	Sulfate	Pyritic	Organic		Initial deformation temperature	Softening temperature	Fluid temperature		
LOWER KITTANNING (NO. 5) COAL (continued)																							
Tuscarawas (continued)	Salem	1171	2	40	2.3	4.6	40.2	48.2	7.0	5.8	69.7	1.5	12.4	3.7	0.01	1.98	1.70	4.0	2120	2200	2340	12,840	79
			3				42.1	50.5	7.3	5.5	73.1	1.6	8.7	3.9	0.01	2.08	1.78					13,460	
			4				45.5	54.5		6.0	78.8	1.7	9.4	4.2	0.01	2.24	1.92					14,520	
	Sugar Creek	1225	2	38	3.0	5.1	40.3	51.1	3.5	5.5	71.6	1.6	15.4	2.5	0.01	0.73	1.73	2.0	1920	2010	2090	12,740	79
			3				42.5	53.8	3.7	5.2	75.4	1.7	11.5	2.6	0.01	0.77	1.82					13,430	
			4				44.1	55.9		5.4	78.3	1.8	11.9	2.7	0.01	0.80	1.89					13,940	
	Warren	1251	2	23	1.1	2.9	39.7	48.0	9.4	5.3	70.1	1.7	11.2	2.3	0.02	0.94	1.31	5.0	2510	2600	2720	12,790	79
			3				40.9	49.4	9.7	5.1	72.2	1.8	8.9	2.4	0.02	0.97	1.35					13,180	
			4				45.3	54.7		5.7	79.9	1.9	9.8	2.6	0.02	1.07	1.49					14,590	
	Wayne	1189	2	31	2.2	4.9	40.1	45.8	9.2	5.4	66.3	1.3	12.1	5.7	0.04	3.94	1.67	4.0	2010	2100	2190	12,230	79
			3				42.2	48.2	9.7	5.1	69.7	1.4	8.1	6.0	0.04	4.14	1.76					12,860	
			4				46.7	53.3		5.7	77.2	1.5	9.0	6.6	0.05	4.59	1.94					14,240	
STRASBURG (NO. 5A) COAL																							
Tuscarawas	Dover	1197	2	26	5.5	8.4	40.4	44.9	6.3	5.7	67.5	1.5	18.0	1.1	0.01	0.38	0.70	1.0	2400	2490	2590	12,090	79
			3				44.1	49.0	6.9	5.2	73.7	1.6	11.5	1.2	0.01	0.41	0.76					13,190	
			4				47.4	52.6		5.6	79.1	1.8	12.3	1.3	0.01	0.45	0.82					14,170	
		1205	2	22	1.5	3.7	43.4	39.5	13.4	5.4	64.5	1.4	9.1	6.3	0.04	4.77	1.48	3.0	1940	2010	2090	12,040	79
			3				45.1	41.0	13.9	5.2	67.0	1.5	6.0	6.5	0.04	4.95	1.54					12,500	
			4				52.4	47.6		6.0	77.8	1.7	7.0	7.6	0.05	5.75	1.79					14,520	
		1228	2	33	3.3	5.2	38.6	39.4	16.8	5.1	59.4	1.3	10.7	6.6	0.01	4.41	2.18	2.5	1880	2000	2080	11,160	79
			3				40.7	41.6	17.7	4.8	62.7	1.4	6.4	7.0	0.01	4.65	2.30					11,770	
			4				49.5	50.5		5.8	76.2	1.7	7.8	8.5	0.01	5.65	2.79					14,310	
	Fairfield	1190	2	13	2.3	4.6	39.0	40.6	15.8	5.1	59.5	1.4	11.0	7.2	0.02	5.48	1.70	3.0	2010	2090	2210	11,230	79
			3				40.9	42.6	16.6	4.8	62.4	1.5	7.2	7.5	0.02	5.74	1.78					11,770	
			4				49.0	51.0		5.8	74.7	1.8	8.7	9.0	0.03	6.88	2.14					14,110	
	Franklin	1194	2	18	1.6	3.9	48.2	39.0	8.9	5.9	68.3	1.5	11.4	4.1	0.04	2.68	1.36	2.0	1940	2020	2120	12,740	79
			3				50.2	40.6	9.3	5.7	71.1	1.6	8.3	4.3	0.04	2.79	1.42					13,250	
			4				55.3	44.7		6.3	78.3	1.7	9.1	4.7	0.05	3.07	1.56					14,610	
	Lawrence	1182	2	22	1.8	4.1	44.0	40.1	11.8	5.5	65.9	1.5	10.6	4.8	0.05	3.46	1.26	2.5	1940	2050	2170	12,170	79
			3				45.9	41.8	12.3	5.3	68.7	1.6	7.3	5.0	0.05	3.61	1.31					12,690	
			4				52.3	47.7		6.0	78.4	1.8	8.3	5.7	0.06	4.11	1.50					14,470	
	Sandy	1204	2	15	2.4	5.4	41.5	41.1	12.0	5.5	64.0	1.4	15.7	1.5	0.02	0.72	0.72	1.0	2610	2690	2780	11,540	79
			3				43.9	43.4	12.7	5.2	67.7	1.5	11.5	1.6	0.02	0.76	0.76					12,190	
			4				50.2	49.8		5.9	77.5	1.7	13.2	1.8	0.02	0.87	0.87					13,960	
MIDDLE KITTANNING (NO. 6) COAL																							
Carroll	Brown	1247	2	28	1.3	3.1	38.0	49.7	9.2	5.4	71.0	1.7	10.0	2.6	0.01	1.64	0.98	4.0	2410	2520	2630	12,800	79
			3				39.2	51.3	9.5	5.2	73.3	1.8	7.5	2.7	0.01	1.69	1.01					13,210	
			4				43.3	56.7		5.8	81.0	1.9	8.3	3.0	0.01	1.87	1.12					14,600	
	Rose	1233	2	48	0.8	2.6	43.4	45.4	8.6	5.5	70.4	1.7	9.3	4.6	0.01	2.59	1.96	4.5	1910	2000	2080	12,890	79
			3				44.6	46.6	8.8	5.4	72.3	1.7	7.2	4.7	0.01	2.66	2.01					13,240	
			4				48.9	51.1		5.9	79.3	1.9	7.9	5.2	0.01	2.92	2.21					14,520	
		1236	2	36	1.3	3.5	39.7	51.5	5.3	5.5	73.6	1.9	11.4	2.3	0.02	0.73	1.55	5.0	2480	2570	2660	13,200	79
			3				41.1	53.4	5.5	5.3	76.3	2.0	8.6	2.4	0.02	0.76	1.61					13,670	
			4				43.5	56.5		5.6	80.7	2.1	9.1	2.5	0.02	0.80	1.70					14,470	
Coshocton	Adams	1256	2	25	5.6	16.1	39.4	33.6	10.9	4.6	52.3	1.2	29.9	1.0	0.01	0.03	0.99	0.0	2240	2330	2370	8,430	80
			3				47.0	40.0	13.0	3.4	62.4	1.4	18.6	1.2	0.01	0.04	1.18					10,040	
			4				54.0	46.0		3.9	71.7	1.6	21.4	1.4	0.01	0.04	1.36					11,550	

		1263	2	17	2.5	3.5	35.8	49.7	11.1	5.1	67.7	1.4	11.3	3.4	0.28	1.90	1.25	5.5	2110	2200	2320	12,230	80
			3				37.1	51.5	11.5	4.9	70.1	1.5	8.5	3.6	0.29	1.97	1.30					12,670	
			4				41.9	58.1		5.5	79.2	1.7	9.6	4.0	0.33	2.22	1.46					14,310	
	Bedford	1167	2	28	3.6	6.7	42.7	47.4	3.2	5.9	70.5	1.4	16.5	2.4	0.01	1.16	1.27	4.0	2050	2140	2220	12,930	79
			3				45.8	50.8	3.4	5.5	75.6	1.5	11.3	2.6	0.01	1.24	1.36					13,860	
			4				47.4	52.6		5.7	78.2	1.6	11.7	2.7	0.01	1.29	1.41					14,350	
	Franklin	1159	2	47	2.6	5.3	42.0	45.9	6.8	5.9	69.3	1.4	12.7	3.9	0.01	2.54	1.36	3.0	2130	2250	2350	12,650	79
			3				44.4	48.5	7.2	5.6	73.2	1.5	8.4	4.1	0.01	2.68	1.44					13,350	
			4				47.8	52.2		6.0	78.8	1.6	9.1	4.4	0.01	2.89	1.55					14,390	
	Keene	1162	2	41	5.2	9.1	35.7	44.6	10.6	5.3	60.3	1.3	19.8	2.8	0.01	1.06	1.69	1.0	2380	2480	2600	10,700	79
			3				39.3	49.1	11.7	4.7	66.3	1.4	12.9	3.1	0.01	1.17	1.86					11,770	
			4				44.5	55.5		5.3	75.1	1.6	14.6	3.5	0.01	1.32	2.10					13,320	
		1187	2	35	3.1	6.3	41.9	49.6	2.2	5.7	73.5	1.5	15.1	2.0	0.01	0.64	1.30	4.5	2100	2180	2260	13,310	79
			3				44.7	52.9	2.3	5.3	78.4	1.6	10.1	2.1	0.01	0.68	1.39					14,200	
			4				45.8	54.2		5.5	80.3	1.6	10.4	2.2	0.01	0.70	1.42					14,550	
	Lafayette	1160	2	31	2.7	5.6	43.1	48.3	3.0	5.9	72.3	1.5	14.5	2.8	0.01	1.51	1.26	4.0	2120	2230	2340	13,170	79
			3				45.7	51.2	3.2	5.6	76.6	1.6	10.1	3.0	0.01	1.60	1.33					13,950	
			4				47.2	52.8		5.8	79.1	1.6	10.4	3.1	0.01	1.65	1.38					14,410	
	Oxford	1260	2	36	3.7	4.7	40.1	52.5	2.7	5.7	73.3	1.5	14.6	2.2	0.13	0.51	1.55	2.0	2060	2200	2350	13,090	80
			3				42.1	55.1	2.8	5.4	76.9	1.6	11.0	2.3	0.14	0.54	1.63					13,740	
			4				43.3	56.7		5.6	79.2	1.6	11.3	2.4	0.14	0.55	1.67					14,140	
Gallia	Walnut	1139	2	33	2.9	7.5	38.2	47.8	6.5	5.6	68.4	1.4	15.8	2.4	0.03	2.00	0.34	0.0	2090	2180	2270	12,280	79
			3				41.3	51.7	7.0	5.2	73.9	1.5	9.9	2.6	0.03	2.16	0.37					13,280	
			4				44.4	55.6		5.5	79.5	1.6	10.6	2.8	0.03	2.33	0.40					14,280	
Holmes	Berlin	1207	2	28	6.3	8.6	38.6	47.0	5.8	5.7	68.2	1.4	15.1	3.9	0.01	2.90	0.99	3.0	2010	2100	2220	12,370	79
			3				42.2	51.4	6.3	5.2	74.6	1.5	8.2	4.3	0.01	3.17	1.08					13,530	
			4				45.1	54.9		5.5	79.7	1.6	8.7	4.6	0.01	3.39	1.16					14,450	
		1208	2	18	1.8	3.6	39.0	45.8	11.6	5.0	64.7	1.5	9.4	7.8	0.01	6.85	0.94	4.0	2130	2260	2330	12,010	79
			3				40.5	47.5	12.0	4.8	67.1	1.6	6.4	8.1	0.01	7.11	0.98					12,460	
			4				46.0	54.0		5.4	76.3	1.8	7.3	9.2	0.01	8.08	1.11					14,160	
	Clark	1271	2	35	2.0	4.8	38.6	50.9	5.8	5.3	68.9	1.4	14.5	4.2	0.70	1.81	1.65	2.0	2060	2140	2200	12,410	79
			3				40.5	53.4	6.1	5.0	72.3	1.5	10.7	4.4	0.74	1.90	1.73					13,030	
			4				43.1	56.9		5.4	77.0	1.6	11.4	4.7	0.78	2.02	1.85					13,870	
	Walnut Creek	1209	2	23	3.7	6.2	41.0	47.6	5.2	5.7	70.7	1.6	13.9	2.9	0.01	2.46	0.48	3.5	1970	2080	2190	12,830	79
			3				43.7	50.7	5.5	5.3	75.4	1.7	8.9	3.1	0.01	2.62	0.51					13,680	
			4				46.3	53.7		5.7	79.8	1.8	9.5	3.3	0.01	2.78	0.54					14,480	
Jackson	Madison	1137	2	17[3]	3.9	8.6	39.7	47.7	4.0	6.0	70.0	1.5	17.2	1.4	0.07	0.96	0.34	1.0	2000	2120	2210	12,540	79
			3				43.4	52.2	4.4	5.5	76.6	1.6	10.5	1.5	0.08	1.05	0.37					13,720	
			4				45.4	54.6		5.8	80.1	1.7	10.9	1.6	0.08	1.10	0.39					14,340	
		1138	2	16[3]	7.0	10.2	32.9	49.5	7.4	5.7	64.6	1.4	18.1	2.8	0.05	2.07	0.67	1.5	2120	2240	2330	11,460	79
			3				36.6	55.1	8.2	5.1	71.9	1.6	10.1	3.1	0.06	2.31	0.75					12,760	
			4				39.9	60.1		5.5	78.4	1.7	11.0	3.4	0.06	2.51	0.81					13,900	
Muskingum	Adams	1157	2	47	2.4	5.0	44.4	47.1	3.5	6.1	72.8	1.4	13.2	3.1	0.01	1.23	1.85	3.5	2180	2290	2370	13,300	79
			3				46.7	49.6	3.7	5.8	76.6	1.5	9.2	3.3	0.01	1.29	1.95					14,000	
			4				48.5	51.5		6.1	79.6	1.5	9.6	3.4	0.01	1.34	2.02					14,530	
Perry	Clayton	1153	2	32	3.5	6.5	43.2	45.3	5.0	5.8	68.7	1.4	16.5	2.6	0.02	1.52	1.06	3.5	1920	2030	2120	12,680	79
			3				46.2	48.4	5.3	5.4	73.5	1.5	11.5	2.8	0.02	1.63	1.13					13,560	
			4				48.8	51.2		5.7	77.6	1.6	12.1	2.9	0.02	1.72	1.20					14,330	
	Pike	1152	2	49	3.5	7.1	38.8	43.3	10.8	5.4	64.4	1.3	15.1	3.0	0.02	2.07	0.89	3.5	2090	2170	2280	11,650	79
			3				41.8	46.6	11.6	5.0	69.3	1.4	9.5	3.2	0.02	2.23	0.96					12,540	
			4				47.3	52.7		5.6	78.4	1.6	10.7	3.7	0.02	2.52	1.08					14,190	
Stark	Osnaburg	1245	2	33	1.5	3.6	41.2	47.7	7.5	5.5	71.2	1.8	11.3	2.7	0.01	1.61	1.12	4.0	2420	2530	2610	12,920	79
			3				42.7	49.5	7.8	5.3	73.9	1.9	8.4	2.8	0.01	1.67	1.16					13,400	
			4				46.3	53.7		5.7	80.1	2.0	9.1	3.0	0.01	1.81	1.26					14,530	

County	Township	DGS file no.	Condition	Analyzed thickness (nearest in)	Air-dried loss (%)	Proximate analysis (%)				Ultimate analysis (%)					Forms of sulfur (%)			Free-swelling index	Fusibility of ash (°F)			Heating value (Btu/lb)	Year
						Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Total sulfur	Sulfate	Pyritic	Organic		Initial deformation temperature	Softening temperature	Fluid temperature		
MIDDLE KITTANNING (NO. 6) COAL (continued)																							
Stark (continued)	Paris	1240	2	26	1.4	3.1	37.7	48.8	10.4	5.2	69.9	1.6	10.8	2.0	0.02	0.95	1.06	4.0	2590	2680	2760	12,600	79
			3				38.9	50.4	10.7	5.0	72.1	1.7	8.3	2.1	0.02	0.98	1.09					13,000	
			4				43.6	56.4		5.6	80.8	1.8	9.3	2.3	0.02	1.10	1.23					14,560	
		1249	2	26	1.3	3.4	37.3	48.8	10.5	5.3	69.6	1.7	10.9	2.1	0.01	1.18	0.95	3.5	2510	2590	2680	12,510	79
			3				38.6	50.5	10.9	5.1	72.0	1.8	8.2	2.2	0.01	1.22	0.98					12,950	
			4				43.3	56.7		5.7	80.8	2.0	9.1	2.4	0.01	1.37	1.10					14,530	
Tuscarawas	Auburn	1178	2	32	2.8	5.4	40.2	45.5	8.9	5.5	66.9	1.4	12.4	4.9	0.03	3.60	1.30	4.5	1980	2080	2170	12,320	79
			3				42.5	48.1	9.4	5.2	70.7	1.5	8.0	5.2	0.03	3.81	1.37					13,020	
			4				46.9	53.1		5.7	78.1	1.6	8.9	5.7	0.04	4.20	1.52					14,370	
	Bucks	1186	2	20	3.7	7.2	38.4	50.2	4.2	5.3	70.4	1.4	16.8	1.9	0.01	1.08	0.81	1.5	1900	2020	2140	12,550	79
			3				41.4	54.1	4.5	4.8	75.9	1.5	11.2	2.0	0.01	1.16	0.87					13,530	
			4				43.3	56.7		5.1	79.5	1.6	11.7	2.1	0.01	1.22	0.91					14,170	
	Clay	1221	2	38	1.1	2.6	42.2	48.3	6.9	5.5	72.7	1.6	10.1	3.3	0.01	2.02	1.24	4.5	2000	2110	2220	13,100	79
			3				43.3	49.6	7.1	5.4	74.6	1.6	8.0	3.4	0.01	2.07	1.27					13,450	
			4				46.6	53.4		5.8	80.3	1.8	8.6	3.6	0.01	2.23	1.37					14,470	
	Dover	1128	2	35	3.9	6.5	40.4	48.0	5.1	5.9	70.4	1.4	14.2	3.0	0.19	1.14	1.63	4.0	2130	2220	2350	12,660	79
			3				43.2	51.3	5.5	5.5	75.3	1.5	9.0	3.2	0.20	1.22	1.74					13,530	
			4				45.7	54.3		5.9	79.6	1.6	9.5	3.4	0.21	1.29	1.84					14,320	
		1198	2	36	4.6	8.1	37.9	50.6	3.4	5.6	69.0	1.5	18.8	1.9	0.02	0.25	1.59	1.0	2750	2800	2800	12,200	79
			3				41.2	55.1	3.7	5.1	75.1	1.6	12.6	2.1	0.02	0.27	1.73					13,270	
			4				42.8	57.2		5.3	78.0	1.7	13.1	2.1	0.02	0.28	1.80					13,780	
	Fairfield	1181	2	51	2.3	5.2	41.7	47.8	5.3	5.6	71.8	1.5	13.0	2.8	0.01	1.02	1.81	3.0	2020	2130	2230	12,940	79
			3				44.0	50.4	5.6	5.3	75.7	1.6	8.8	3.0	0.01	1.08	1.91					13,650	
			4				46.6	53.4		5.6	80.2	1.7	9.4	3.1	0.01	1.14	2.02					14,460	
		1191	2	40	3.0	6.0	39.2	49.6	5.2	5.4	70.2	1.6	15.0	2.6	0.01	1.28	1.33	3.0	1970	2090	2200	12,620	79
			3				41.7	52.8	5.5	5.0	74.7	1.7	10.3	2.8	0.01	1.36	1.41					13,420	
			4				44.1	55.9		5.3	79.1	1.8	10.9	2.9	0.01	1.44	1.50					14,210	
	Franklin	1195	2	20	1.3	3.2	49.7	40.1	7.0	6.0	69.8	1.5	12.4	3.2	0.01	1.86	1.35	3.0	2030	2150	2300	13,300	79
			3				51.3	41.4	7.2	5.8	72.1	1.5	9.9	3.3	0.01	1.92	1.39					13,740	
			4				55.3	44.7		6.3	77.7	1.7	10.6	3.6	0.01	2.07	1.50					14,810	
		1199	2	26	9.1	13.0	37.4	41.6	8.0	5.5	59.3	1.4	24.7	1.1	0.02	0.25	0.82	1.0	2750	2800	2800	10,450	79
			3				43.0	47.8	9.2	4.7	68.2	1.6	15.1	1.3	0.02	0.29	0.94					12,010	
			4				47.3	52.7		5.1	75.1	1.8	16.6	1.4	0.03	0.32	1.04					13,230	
	Goshen	1202	2	56	2.4	4.7	41.5	47.4	6.4	5.5	69.8	1.4	13.9	3.0	0.01	1.35	1.66	4.5	2070	2160	2310	12,890	79
			3				43.5	49.7	6.7	5.2	73.2	1.5	10.2	3.1	0.01	1.42	1.74					13,530	
			4				46.7	53.3		5.6	78.5	1.6	10.9	3.4	0.01	1.52	1.87					14,500	
		1222	2	46	1.5	3.3	41.7	49.2	5.8	5.4	72.3	1.6	11.6	3.4	0.01	1.69	1.66	5.5	2060	2140	2230	13,170	79
			3				43.1	50.9	6.0	5.2	74.8	1.7	9.0	3.5	0.01	1.75	1.72					13,620	
			4				45.9	54.1		5.5	79.5	1.8	9.5	3.7	0.01	1.86	1.83					14,490	
		1252	2	47	1.4	3.9	39.0	49.5	7.6	5.3	70.6	1.8	12.5	2.2	0.01	0.85	1.30	2.5	2500	2570	2650	12,680	79
			3				40.6	51.5	7.9	5.1	73.5	1.9	9.4	2.3	0.01	0.88	1.35					13,190	
			4				44.1	55.9		5.5	79.8	2.0	10.2	2.5	0.01	0.96	1.47					14,320	
	Jefferson	1179	2	29	2.8	5.7	41.4	48.6	4.3	5.9	71.1	1.6	14.4	2.7	0.02	1.58	1.15	4.5	1970	2070	2160	12,950	79
			3				43.9	51.5	4.6	5.6	75.4	1.7	9.9	2.9	0.02	1.68	1.22					13,740	
			4				46.0	54.0		5.9	79.0	1.8	10.4	3.0	0.02	1.76	1.28					14,390	
	Lawrence	1183	2	34	1.8	4.5	43.3	43.9	8.3	5.5	69.2	1.4	13.2	2.5	0.02	1.07	1.37	4.0	2470	2570	2660	12,570	79
			3				45.3	46.0	8.7	5.2	72.5	1.5	9.6	2.6	0.02	1.12	1.43					13,170	
			4				49.7	50.3		5.7	79.4	1.6	10.6	2.9	0.02	1.23	1.57					14,420	

	Salem	1168	2	49	1.7	3.9	42.7	46.0	7.4	5.7	69.3	1.4	12.7	3.5	0.01	1.95	1.55	3.0	2050	2140	2230	12,960	79
			3				44.4	47.9	7.7	5.5	72.1	1.5	9.6	3.6	0.01	2.03	1.61					13,480	
			4				48.1	51.9		5.9	78.1	1.6	10.4	3.9	0.01	2.20	1.75					14,610	
		1170	2	34	2.0	4.4	42.3	47.2	6.1	5.8	70.1	1.5	13.2	3.3	0.01	1.68	1.59	3.0	2020	2110	2200	12,990	79
			3				44.2	49.4	6.4	5.6	73.3	1.6	9.7	3.5	0.01	1.76	1.66					13,580	
			4				47.3	52.7		5.9	78.3	1.7	10.4	3.7	0.01	1.88	1.78					14,510	
		1176	2	35	3.4	6.2	42.4	46.2	5.2	6.1	70.6	1.4	13.1	3.6	0.02	1.99	1.57	3.0	1960	2050	2140	12,900	79
			3				45.2	49.3	5.5	5.8	75.3	1.5	8.1	3.8	0.02	2.12	1.67					13,750	
			4				47.9	52.1		6.1	79.7	1.6	8.6	4.1	0.02	2.25	1.77					14,560	
	Sandy	1203	2	39	2.4	5.2	38.5	46.8	9.5	5.2	65.8	1.3	13.3	4.9	0.13	3.93	0.84	4.0	1920	1990	2080	12,180	79
			3				40.6	49.4	10.0	4.9	69.4	1.4	9.2	5.2	0.14	4.15	0.89					12,850	
			4				45.1	54.9		5.4	77.1	1.5	10.2	5.7	0.15	4.61	0.98					14,280	
	Warren	1230	2	31	1.5	3.1	36.9	48.0	12.0	5.1	68.0	1.4	10.3	3.2	0.01	1.83	1.31	3.5	2140	2300	2410	12,330	79
			3				38.1	49.5	12.4	4.9	70.2	1.4	7.8	3.3	0.01	1.89	1.35					12,720	
			4				43.5	56.5		5.6	80.1	1.6	8.9	3.8	0.01	2.16	1.54					14,520	
	Warwick	1175	2	40	2.3	4.2	41.2	46.9	7.7	5.5	68.9	1.4	11.8	4.7	0.12	3.19	1.36	7.5	2040	2130	2210	12,650	79
			3				43.0	49.0	8.0	5.3	71.9	1.5	8.4	4.9	0.13	3.33	1.42					13,200	
			4				46.8	53.2		5.7	78.2	1.6	9.2	5.3	0.14	3.62	1.54					14,360	
		1184	2	42	2.6	5.1	41.4	48.9	4.6	5.6	71.6	1.4	14.2	2.6	0.01	1.09	1.48	4.0	2000	2120	2260	12,950	79
			3				43.6	51.5	4.8	5.3	75.4	1.5	10.2	2.7	0.01	1.15	1.56					13,640	
			4				45.8	54.2		5.6	79.3	1.6	10.7	2.9	0.01	1.21	1.64					14,340	
	York	1177	2	32	2.8	5.6	41.8	48.7	3.9	5.6	69.7	1.4	16.9	2.4	0.02	0.86	1.53	3.5	2070	2160	2270	12,910	79
			3				44.3	51.6	4.1	5.3	73.8	1.5	12.6	2.5	0.02	0.91	1.62					13,670	
			4				46.2	53.8		5.5	77.0	1.5	13.2	2.7	0.02	0.95	1.69					14,260	
LOWER FREEPORT (NO. 6A) COAL																							
Carroll	Rose	1234	2	27	0.4	2.3	44.1	42.2	11.4	5.5	68.1	1.9	9.2	3.9	0.02	3.03	0.87	3.5	1980	2090	2170	12,580	79
			3				45.1	43.2	11.7	5.4	69.7	1.9	7.3	4.0	0.02	3.10	0.89					12,880	
			4				51.1	48.9		6.1	78.9	2.2	8.3	4.5	0.02	3.51	1.01					14,580	
Hocking	Starr	1375	2	26	1.8	4.4	40.0	45.3	10.3	5.2	66.9	1.4	12.5	3.8	0.14	1.56	2.06	4.0	2130	2220	2360	12,050	80
			3				41.9	47.4	10.7	4.9	70.0	1.4	9.0	3.9	0.15	1.63	2.15					12,610	
			4				46.9	53.1		5.5	78.4	1.6	10.1	4.4	0.16	1.83	2.41					14,120	
Tuscarawas	Salem	1172	2	33	1.6	2.9	12.3	7.6	77.2	1.8	11.0	0.3	5.1	4.5	0.03	4.50	0.01	0.0	2200	2290	2380	2,050	79
			3				12.7	7.8	79.5	1.5	11.3	0.3	2.6	4.6	0.03	4.63	0.01					2,110	
			4				61.8	38.2		7.4	55.3	1.5	12.7	22.6	0.15	22.61	0.05					10,290	
UPPER FREEPORT (NO. 7) COAL																							
Carroll	Rose	1235	2	15[4]	0.4	2.3	33.7	40.9	23.1	4.6	58.2	1.6	9.5	3.1	0.01	1.94	1.14	1.5	2450	2540	2610	10,440	79
			3				34.5	41.9	23.6	4.4	59.6	1.6	7.6	3.2	0.01	1.99	1.17					10,690	
			4				45.2	54.8		5.8	78.0	2.1	10.0	4.2	0.01	2.60	1.53					14,000	
		1235-1	2	12[5]	0.6	2.5	30.7	39.3	27.5	4.3	54.7	1.4	9.8	2.2	0.02	1.37	0.86	0.0	2390	2480	2560	9,710	79
			3				31.5	40.3	28.2	4.1	56.1	1.4	7.8	2.3	0.02	1.41	0.88					9,960	
			4				43.9	56.1		5.7	78.1	2.0	10.8	3.1	0.03	1.96	1.23					13,870	
Columbiana	Hanover	1377	2	30	0.8	3.2	36.6	50.7	9.5	5.0	69.5	1.6	10.0	4.3	0.12	3.09	1.11	4.5	2010	2070	2170	12,590	80
			3				37.8	52.3	9.9	4.8	71.8	1.7	7.4	4.5	0.12	3.19	1.15					13,000	
			4				41.9	58.1		5.3	79.6	1.9	8.2	5.0	0.14	3.54	1.27					14,430	
Guernsey	Jackson	1163	2	65	2.9	5.6	35.6	50.5	8.3	5.4	69.3	1.5	13.2	2.4	0.01	2.15	0.23	4.5	2150	2240	2380	12,440	79
			3				37.7	53.5	8.8	5.1	73.4	1.6	8.7	2.5	0.01	2.28	0.24					13,180	
			4				41.3	58.7		5.5	80.5	1.7	9.5	2.8	0.01	2.50	0.27					14,450	
Harrison	Washington	1174	2	29	3.4	6.3	35.3	50.7	7.7	5.4	68.8	1.5	14.6	1.9	0.01	1.77	0.12	3.5	2110	2200	2340	12,480	79
			3				37.7	54.1	8.2	5.0	73.4	1.6	9.6	2.0	0.01	1.89	0.13					13,320	
			4				41.0	59.0		5.5	80.0	1.7	10.5	2.2	0.01	2.06	0.14					14,520	
Hocking	Ward	1151	2	47	4.0	7.1	38.2	44.4	10.3	5.5	63.9	1.3	14.1	5.0	0.01	4.18	0.81	3.0	1990	2080	2160	11,660	79
			3				41.1	47.8	11.1	5.1	68.8	1.4	8.4	5.4	0.01	4.50	0.87					12,550	
			4				46.2	53.8		5.7	77.4	1.6	9.4	6.1	0.01	5.06	0.98					14,120	
Perry	Monroe	1156	2	51	3.8	7.8	36.3	48.6	7.3	5.6	67.7	1.4	16.0	2.0	0.01	1.88	0.12	3.0	2170	2310	2400	12,050	79
			3				39.4	52.7	7.9	5.1	73.4	1.5	9.8	2.2	0.01	2.04	0.13					13,060	
			4				42.8	57.2		5.6	79.7	1.6	10.7	2.4	0.01	2.21	0.14					14,190	

County	Township	DGS file no.	Condition	Analyzed thickness (nearest in)	Air-dried loss (%)	Proximate analysis (%)				Ultimate analysis (%)					Forms of sulfur (%)			Free-swelling index	Fusibility of ash (°F)			Heating value (Btu/lb)	Year
						Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Total sulfur	Sulfate	Pyritic	Organic		Initial deformation temperature	Softening temperature	Fluid temperature		
UPPER FREEPORT (NO. 7) COAL (continued)																							
Stark	Paris	1250	2	15	0.6	2.3	37.4	42.8	17.5	4.9	63.7	1.5	9.1	3.3	0.01	2.54	0.78	4.5	2220	2310	2400	11,600	79
			3				38.3	43.8	17.9	4.8	65.2	1.5	7.2	3.4	0.01	2.60	0.80					11,870	
			4				46.6	53.4		5.8	79.4	1.9	8.8	4.1	0.01	3.17	0.97					14,470	
Tuscarawas	Salem	1169	2	16	3.6	7.6	35.9	50.9	5.6	5.7	68.6	1.6	17.4	1.1	0.01	0.47	0.60	1.0	2060	2150	2290	12,190	79
			3				38.9	55.1	6.1	5.3	74.2	1.7	11.5	1.2	0.01	0.51	0.65					13,190	
			4				41.4	58.6		5.6	79.0	1.8	12.3	1.3	0.01	0.54	0.69					14,040	
		1173	2	16	3.7	6.8	32.2	47.8	13.2	5.1	63.4	1.5	15.5	1.3	0.01	1.21	0.04	1.5	2500	2580	2650	11,410	79
			3				34.5	51.3	14.2	4.7	68.0	1.6	10.1	1.4	0.01	1.30	0.04					12,240	
			4				40.2	59.7		5.4	79.2	1.9	11.8	1.6	0.01	1.51	0.05					14,260	
MAHONING COAL																							
Carroll	East	1378	2	16	1.5	4.7	34.7	51.8	8.8	5.0	70.0	1.7	12.8	1.8	0.19	1.28	0.37	1.5	1970	2100	2260	12,390	80
			3				36.4	54.4	9.2	4.7	73.4	1.8	9.0	1.9	0.20	1.34	0.39					13,000	
			4				40.1	59.9		5.1	80.8	2.0	9.9	2.1	0.22	1.48	0.43					14,320	
Columbiana	Hanover	1376	2	17	1.0	3.2	33.1	52.8	10.8	5.1	69.5	1.6	11.0	1.9	0.22	1.43	0.28	3.5	2220	2320	2460	12,470	80
			3				34.2	54.6	11.2	4.9	71.9	1.7	8.4	2.0	0.23	1.48	0.29					12,890	
			4				38.5	61.5		5.5	80.9	1.9	9.4	2.2	0.26	1.66	0.33					14,500	
ANDERSON COAL																							
Guernsey	Jackson	1164	2	18	2.9	5.7	34.9	42.4	17.0	5.2	59.5	1.3	13.6	3.3	0.01	2.64	0.66	1.0	1940	2050	2140	10,800	79
			3				37.0	45.0	18.0	4.8	63.1	1.4	9.0	3.5	0.01	2.80	0.70					11,450	
			4				45.1	54.9		5.9	77.0	1.7	11.0	4.3	0.01	3.42	0.85					13,970	
	Washington	1166	2	36	2.4	5.0	38.7	49.9	6.4	5.4	70.0	1.6	13.5	3.0	0.01	2.43	0.58	4.5	1960	2070	2150	12,730	79
			3				40.7	52.5	6.7	5.1	73.7	1.7	9.5	3.2	0.01	2.56	0.61					13,390	
			4				43.7	56.3		5.5	79.0	1.8	10.2	3.4	0.01	2.74	0.65					14,360	
Muskingum	Highland	1158	2	27	2.3	4.7	37.3	46.6	11.4	5.3	66.3	1.4	11.9	3.7	0.01	2.43	1.28	5.0	2010	2090	2210	11,950	79
			3				39.1	48.9	12.0	5.0	69.6	1.5	8.1	3.9	0.01	2.55	1.34					12,540	
			4				44.5	55.5		5.7	79.0	1.7	9.2	4.4	0.01	2.90	1.53					14,250	
HARLEM COAL																							
Carroll	Lee	1244	2	18	1.3	3.3	35.7	51.2	9.8	5.2	70.8	1.9	10.7	1.6	0.01	1.22	0.33	4.0	2140	2270	2390	12,710	79
			3				36.9	52.9	10.1	5.0	73.2	2.0	8.0	1.7	0.01	1.26	0.34					13,140	
			4				41.1	58.9		5.6	81.5	2.2	8.9	1.8	0.01	1.40	0.38					14,630	
	Perry	1241	2	26	2.1	3.7	33.6	51.1	11.6	5.2	69.6	1.8	11.2	0.5	0.02	0.07	0.46	4.5	2640	2710	2780	12,380	79
			3				34.9	53.1	12.0	5.0	72.3	1.9	8.2	0.5	0.02	0.07	0.48					12,860	
			4				39.7	60.3		5.7	82.2	2.1	9.3	0.6	0.02	0.08	0.54					14,620	
AMES COAL																							
Carroll	Lee	1242	2	15	1.5	2.8	43.1	37.8	16.3	5.2	63.5	1.7	7.1	6.2	0.01	4.55	1.66	3.5	1940	2010	2090	11,890	79
			3				44.3	38.9	16.8	5.0	65.3	1.7	4.7	6.4	0.01	4.68	1.71					12,240	
			4				53.3	46.7		6.0	78.5	2.1	5.7	7.7	0.01	5.62	2.05					14,700	
PITTSBURGH (NO. 8) COAL																							
Gallia	Clay	1146	2	24	2.1	6.1	39.9	45.7	8.3	5.4	65.8	1.2	15.8	3.4	0.01	3.33	0.07	4.5	1950	2050	2170	12,130	79
			3				42.5	48.7	8.8	5.0	70.1	1.3	11.1	3.6	0.01	3.55	0.07					12,910	
			4				46.6	53.4		5.5	76.9	1.4	12.1	4.0	0.01	3.89	0.08					14,170	
		1147	2	32	4.3	7.0	37.0	46.8	9.2	5.7	66.1	1.3	15.0	2.6	0.01	2.00	0.63	4.5	2150	2270	2350	11,860	79
			3				39.8	50.3	9.9	5.3	71.1	1.4	9.4	2.8	0.01	2.15	0.68					12,750	
			4				44.2	55.8		5.9	78.9	1.6	10.5	3.1	0.01	2.39	0.75					14,150	
		1147-1	2	32	3.6	5.9	32.8	37.0	24.3	4.9	53.2	1.0	12.4	4.3	0.03	3.61	0.64	1.5	2290	2420	2530	9,660	79
			3				34.9	39.3	25.8	4.5	56.5	1.1	7.6	4.6	0.03	3.84	0.68					10,260	
			4				47.0	53.0		6.1	76.2	1.4	10.3	6.2	0.04	5.17	0.92					13,840	
		1147-2	2	12	3.8	6.2	36.2	42.6	15.0	5.4	61.5	1.1	13.8	3.3	0.03	2.51	0.81	5.0	2040	2130	2250	11,060	79
			3				38.6	45.4	16.0	5.0	65.6	1.2	8.8	3.5	0.03	2.68	0.86					11,790	
			4				45.9	54.1		6.0	78.0	1.4	10.5	4.2	0.04	3.19	1.03					14,040	

	Harrison	1140	2	33	4.3	7.1	37.6	44.6	10.7	5.4	63.8	1.2	14.4	4.5	0.02	3.32	1.18	5.0	1950	2030	2140	11,520	79
			3				40.5	48.0	11.5	5.0	68.7	1.3	8.7	4.8	0.02	3.57	1.27					12,400	
			4				45.7	54.3		5.6	77.6	1.5	9.8	5.5	0.02	4.04	1.44					14,010	
		1140-1	2	14	4.2	6.4	28.7	31.7	33.2	4.3	45.2	0.9	12.6	3.9	0.14	3.10	0.62	1.0	2340	2460	2540	8,230	79
			3				30.7	33.9	35.5	3.8	48.3	1.0	7.4	4.2	0.15	3.31	0.66					8,790	
			4				47.5	52.5		5.9	74.8	1.5	11.4	6.5	0.23	5.13	1.03					13,620	
Guernsey	Londonderry	1165	2	52	0.9	2.8	42.5	40.8	13.9	5.2	64.0	1.3	9.0	6.7	0.01	5.16	1.48	4.0	2000	2080	2170	12,010	79
			3				43.7	42.0	14.3	5.0	65.8	1.3	6.7	6.9	0.01	5.31	1.52					12,360	
			4				51.0	49.0		5.9	76.8	1.6	7.8	8.0	0.01	6.19	1.78					14,420	
Harrison	Archer	1363	2	55	0.8	2.9	37.7	49.1	10.4	5.1	69.1	1.5	10.7	3.4	0.18	2.02	1.16	4.0	2140	2190	2400	12,450	80
			3				38.8	50.5	10.7	4.9	71.1	1.5	8.4	3.5	0.19	2.08	1.19					12,810	
			4				43.4	56.6		5.5	79.6	1.7	9.4	3.9	0.21	2.33	1.34					14,340	
		1371	2	53	0.9	2.8	37.6	47.5	12.0	4.9	68.8	1.4	9.8	3.1	0.18	1.47	1.46	4.0	2220	2340	2450	12,320	80
			3				38.7	48.9	12.4	4.8	70.8	1.4	7.5	3.2	0.19	1.51	1.50					12,670	
			4				44.2	55.8		5.4	80.8	1.6	8.5	3.7	0.21	1.73	1.71					14,460	
	German	1373	2	50	1.2	3.4	35.3	49.5	11.8	4.9	68.4	1.4	10.5	2.9	0.22	1.65	1.06	4.5	2080	2190	2340	12,320	80
			3				36.5	51.3	12.3	4.7	70.8	1.5	7.8	3.0	0.23	1.71	1.10					12,750	
			4				41.6	58.4		5.3	80.7	1.7	8.9	3.5	0.26	1.95	1.25					14,530	
Jefferson	Island Creek	1374	2	56	0.7	2.7	34.9	49.4	13.0	4.8	68.0	1.5	9.5	3.2	0.22	1.89	1.04	5.5	2120	2250	2530	12,290	80
			3				35.9	50.7	13.4	4.7	69.9	1.5	7.3	3.2	0.23	1.94	1.07					12,630	
			4				41.4	58.6		5.4	80.7	1.7	8.5	3.7	0.26	2.24	1.23					14,580	
	Ross	1372	2	26	0.8	2.6	36.4	50.5	10.5	5.0	70.5	1.5	10.0	2.6	0.14	1.45	0.97	6.5	2160	2230	2400	12,560	80
			3				37.4	51.8	10.8	4.8	72.4	1.5	7.9	2.6	0.14	1.49	1.00					12,900	
			4				41.9	58.1		5.4	81.1	1.7	8.9	2.9	0.16	1.67	1.12					14,460	
	Wells	1368	2	46	1.4	3.4	35.4	57.0	4.2	5.5	76.6	1.5	11.1	1.0	0.06	0.42	0.54	6.0	2600	2720	2800	13,550	80
			3				36.6	59.0	4.4	5.3	79.3	1.6	8.4	1.1	0.06	0.43	0.56					14,030	
			4				38.3	61.7		5.5	82.9	1.7	8.8	1.1	0.06	0.45	0.58					14,670	
		1368-1	2	25	1.0	2.8	30.6	45.4	21.1	4.4	61.3	1.3	9.2	2.6	0.15	1.72	0.70	5.5	2450	2600	2740	10,790	80
			3				31.5	46.7	21.8	4.3	63.1	1.3	6.9	2.6	0.15	1.77	0.72					11,100	
			4				40.3	59.7		5.4	80.7	1.6	8.9	3.4	0.20	2.26	0.92					14,190	
REDSTONE (NO. 8A) COAL																							
Gallia	Harrison	1141	2	15	2.7	6.6	38.2	44.7	10.5	5.5	64.9	1.2	13.9	4.0	0.03	3.51	0.41	3.5	1960	2070	2150	11,770	79
			3				40.9	47.9	11.2	5.1	69.5	1.3	8.6	4.3	0.03	3.76	0.44					12,600	
			4				46.1	53.9		5.7	78.3	1.4	9.7	4.8	0.04	4.23	0.49					14,200	
Harrison	Archer	1364	2	17	0.9	2.8	31.9	38.1	27.2	4.2	55.2	1.3	9.0	3.2	0.04	2.04	1.10	1.0	2130	2220	2490	9,810	80
			3				32.8	39.2	28.0	4.0	56.7	1.3	6.7	3.3	0.04	2.10	1.13					10,090	
			4				45.6	54.4		5.6	78.7	1.8	9.3	4.5	0.06	2.91	1.57					14,010	
		1365	2	17	0.9	2.9	36.3	49.8	11.0	5.0	70.2	1.4	10.8	1.6	0.05	0.57	0.96	4.5	2450	2560	2680	12,520	80
			3				37.4	51.3	11.3	4.8	72.3	1.5	8.4	1.6	0.05	0.59	0.99					12,900	
			4				42.2	57.8		5.4	81.5	1.7	9.5	1.8	0.06	0.66	1.11					14,540	
	German	1366	2	17	0.8	2.7	36.0	47.1	14.2	4.8	67.2	1.5	9.3	3.0	0.14	1.60	1.25	5.0	2160	2230	2500	12,010	80
			3				37.0	48.4	14.6	4.6	69.1	1.5	7.1	3.1	0.14	1.64	1.28					12,340	
			4				43.3	56.7		5.4	80.9	1.8	8.3	3.6	0.17	1.93	1.50					14,450	
Jefferson	Wayne	1370	2	22	0.8	3.0	36.8	50.3	10.0	5.0	69.6	1.5	10.4	3.6	0.30	1.97	1.29	4.5	2000	2080	2300	12,530	80
			3				37.9	51.9	10.3	4.8	71.7	1.5	8.1	3.7	0.31	2.03	1.33					12,910	
			4				42.2	57.8		5.3	79.9	1.7	9.0	4.1	0.34	2.26	1.48					14,390	
	Wells	1367	2	25	0.8	2.4	31.4	44.6	21.7	4.4	62.1	1.2	8.2	2.4	0.07	1.30	1.00	4.5	2320	2470	2570	10,990	80
			3				32.1	45.7	22.2	4.3	63.6	1.2	6.3	2.4	0.07	1.33	1.02					11,260	
			4				41.3	58.7		5.5	81.8	1.6	8.0	3.1	0.09	1.71	1.32					14,480	
Lawrence	Mason	1142	2	49	2.2	6.2	40.6	42.9	10.3	5.5	63.5	1.1	13.7	6.0	0.03	5.63	0.36	0.0	2000	2090	2200	11,620	79
			3				43.3	45.7	11.0	5.1	67.7	1.2	8.7	6.4	0.03	6.00	0.38					12,390	
			4				48.6	51.4		5.8	76.0	1.3	9.8	7.2	0.04	6.74	0.43					13,920	
		1143	2	45	2.8	7.0	39.4	42.8	10.8	5.4	62.8	1.1	14.3	5.7	0.15	5.01	0.50	4.5	1910	2000	2110	11,560	79
			3				42.4	46.0	11.6	5.0	67.5	1.2	8.7	6.1	0.16	5.39	0.54					12,430	
			4				47.9	52.1		5.6	76.4	1.3	9.8	6.9	0.18	6.09	0.61					14,060	

County	Township	DGS file no.	Condition	Analyzed thickness (nearest in)	Air-dried loss (%)	Proximate analysis (%)				Ultimate analysis (%)					Forms of sulfur (%)			Free-swelling index	Fusibility of ash (°F)			Heating value (Btu/lb)	Year
						Moisture	Volatile matter	Fixed carbon	Ash	Hydrogen	Carbon	Nitrogen	Oxygen	Total sulfur	Sulfate	Pyritic	Organic		Initial deformation temperature	Softening temperature	Fluid temperature		
REDSTONE (NO. 8A) COAL (continued)																							
Lawrence (continued)	Mason (continued)	1143-1	2	23	2.3	4.3	26.6	22.1	47.0	3.6	34.2	0.6	9.1	5.6	0.09	4.79	0.74	1.0	2270	2390	2520	6,240	79
			3				27.8	23.1	49.1	3.3	35.7	0.6	5.5	5.9	0.09	5.01	0.77					6,520	
			4				54.6	45.4		6.4	70.2	1.2	10.8	11.5	0.18	9.84	1.52					12,810	
MEIGS CREEK (NO. 9) COAL																							
Noble	Brookfield	1206	2	56	2.9	5.1	35.2	43.5	16.2	4.8	60.1	1.0	14.2	3.7	0.01	0.93	2.80	1.0	2080	2200	2350	10,670	79
			3				37.1	45.8	17.1	4.5	63.3	1.1	10.2	3.9	0.01	0.98	2.95					11,250	
			4				44.7	55.3		5.4	76.4	1.3	12.3	4.7	0.01	1.18	3.56					13,560	
WAYNESBURG (NO. 11) COAL																							
Jefferson	Warren	1369	2	46	1.3	4.1	30.8	45.6	19.6	4.6	60.3	1.3	12.7	1.5	0.38	0.63	0.53	1.5	2460	2650	2800	10,680	80
			3				32.1	47.5	20.4	4.3	62.9	1.3	9.5	1.6	0.40	0.66	0.55					11,130	
			4				40.3	59.7		5.4	79.0	1.6	11.9	2.0	0.50	0.82	0.69					13,980	

TABLE 3.—*Major, minor, and trace element composition, whole-coal basis, by county*

Key to symbols:
Method (column heads):
E - by emission spectrography on ash
NA - by neutron activation on whole coal
WA - by wet chemistry on ash
WW - by wet chemistry on whole coal
XA - by X-ray fluorescence on ash
XW - by X-ray fluorescence on whole coal
H - not determined due to interference
L - less than value shown
N - not detected

Analyses were performed by the U.S. Geological Survey. The analytical program of the U.S. Geological Survey is periodically revised and improved. The values reported represent the best data available at the time of manuscript preparation. Those determinations made by wet chemistry are quantitative; the remaining methods are considered semiquantitative.
The following elements were looked for but not found: Au, Bi, In, Ir, Os, Pt, Re, Rh, Ru, Te, Tm.

| Township | Seam | DGS file no. | Si % XA | Al % XA | Ca % XA | Mg % WA | Na % WA | K % XA | Fe % XA | Ti % XA | Ag ppm E | As ppm NA | B ppm E | Ba ppm E | Be ppm E | Br ppm NA | Cd ppm WA | Ce ppm NA | Cl ppm XW | Co ppm NA | Cr ppm NA | Cs ppm NA | Cu ppm WA | Dy ppm E | Er ppm E | Eu ppm NA | F ppm WW | Ga ppm E | Gd ppm E | Ge ppm E | Hf ppm NA | Hg ppm WW | Ho ppm E | La ppm NA | Li ppm WA | Lu ppm NA | Mn ppm WA | Mo ppm E | Nb ppm E | Nd ppm E | Ni ppm E | P ppm XW | Pb ppm WA | Pd ppm E | Pr ppm E | Rb ppm NA | Sb ppm NA | Sc ppm NA | Se ppm NA | Sm ppm NA | Sn ppm E | Sr ppm E | Ta ppm NA | Tb ppm NA | Th ppm NA | Tl ppm NA | U ppm NA | V ppm E | W ppm NA | Y ppm E | Yb ppm NA | Zn ppm WA | Zr ppm E |
|---|---|---

TABLE 4.—*Major, minor, and trace element composition, whole-coal basis, by bed*

Key to symbols:
Method (column heads):
E - by emission spectrography on ash
NA - by neutron activation on whole coal
WA - by wet chemistry on ash
WW - by wet chemistry on whole coal
XA - by X-ray fluorescence on ash
XW - by X-ray fluorescence on whole coal
H - not determined due to interference
L - less than value shown
N - not detected

Analyses were performed by the U.S. Geological Survey. The analytical program of the U.S. Geological Survey is periodically revised and improved. The values reported represent the best data available at the time of manuscript preparation. Those determinations made by wet chemistry are quantitative; the remaining methods are considered semiquantitative.
The following elements were looked for but not found: Au, Bi, In, Ir, Os, Pt, Re, Rh, Ru, Te, Tm.

| County | Township | DGS file no. | Si % XA | Al % XA | Ca % XA | Mg % WA | Na % WA | K % XA | Fe % XA | Ti % XA | Ag ppm E | As ppm NA | B ppm E | Ba ppm E | Be ppm E | Br ppm NA | Cd ppm WA | Ce ppm NA | Cl ppm XW | Co ppm NA | Cr ppm NA | Cs ppm NA | Cu ppm WA | Dy ppm E | Er ppm E | Eu ppm NA | F ppm WW | Ga ppm E | Gd ppm E | Ge ppm E | Hf ppm NA | Hg ppm WW | Ho ppm E | La ppm NA | Li ppm WA | Lu ppm NA | Mn ppm WA | Mo ppm E | Nb ppm E | Nd ppm E | Ni ppm E | P ppm XW | Pb ppm WA | Pd ppm E | Pr ppm E | Rb ppm NA | Sb ppm NA | Sc ppm NA | Se ppm NA | Sm ppm NA | Sn ppm E | Sr ppm E | Ta ppm NA | Tb ppm NA | Th ppm NA | Tl ppm NA | U ppm NA | V ppm E | W ppm NA | Y ppm E | Yb ppm NA | Zn ppm WA | Zr ppm E |
|---|---|---

TABLE 5.—*Major and minor oxide and trace element composition of the laboratory ash, by county*

Key to symbols:
Method (column heads):
E - by emission spectrography on ash
NA - by neutron activation on whole coal
WA - by wet chemistry on ash
XA - by X-ray fluorescence on ash
XW - by X-ray fluorescence on whole coal
H - not determined due to interference
L - less than value shown
N - not detected

Analyses were performed by the U.S. Geological Survey. The coals were ashed at 525°C for major, minor, and trace element analysis. These values may not agree exactly with ash values in standard proximate analysis. The analytical program of the U.S. Geological Survey is periodically revised and improved. The values reported represent the best data available at the time of manuscript preparation. Those determinations made by wet chemistry are quantitative; the remaining methods are considered semiquantitative. "The precision and accuracy of the computer spectrographic values (E) are within one bracket at 68% confidence level and two brackets at 95% confidence level. The bracket is logarithmically defined as +50%, -33% of value reported" (U.S. Geological Survey, written commun., 1979). Ash figure is percentage of total coal; SO_3 figure only shows sulfur retained by the sample on ashing. Values for S in the whole coal should be taken from the proximate-ultimate analyses (tables 1 and 2).

The following elements were looked for by emission spectrographic analysis of the ash and were not found: Au, Bi, In, Ir, Os, Pt, Re, Rh, Ru, Te, Tm.

Township	Seam	DGS file no.	Ash %	SiO_2 % XA	Al_2O_3 % XA	CaO % XA	MgO % WA	Na_2O % WA	K_2O % XA	Fe_2O_3 % XA	TiO_2 % XA	P_2O_5 % XW	SO_3 % XA	Ag ppm E	B ppm E	Ba ppm E	Be ppm E	Cd ppm WA	Ce ppm NA	Co ppm NA	Cr ppm NA	Cs ppm NA	Cu ppm WA	Dy ppm E	Er ppm E	Eu ppm NA	Ga ppm E	Gd ppm E	Ge ppm E	Hf ppm NA	Ho ppm E	La ppm NA	Li ppm WA	Lu ppm NA	Mn ppm WA	Mo ppm E	Nb ppm E	Nd ppm E	Ni ppm E	Pb ppm WA	Pd ppm E	Pr ppm E	Rb ppm NA	Sc ppm NA	Sm ppm NA	Sn ppm E	Sr ppm E	Ta ppm NA	Tb ppm NA	Th ppm NA	Tl ppm NA	U ppm NA	V ppm E	W ppm NA	Y ppm E	Yb ppm NA	Zn ppm WA	Zr ppm E
CARROLL COUNTY																																																										
Brown	Middle Kittanning (No. 6)	1247	9.4	40	26	2.2	0.85	0.26	2.1	24	1.2	0.11L	1.8	0.63	500	240	21	2.2	110	32	170	9.6	120	22L	10L	3.7	53	15L	87	5.3	6.8L	43	220	1.3	280	36	9	66	110	110	1.5L	290	1.3	2.6	20	4.6L	37	160	11	46	9.6	290	70
East	Mahoning	1378	10.7	44	19	1.5	0.51	0.16	2.1	26	1.0	1.5	1.3	1.6	400	780	40	2.6	230	140	120	6.5	140	32L	10L	5.5	63	15L	140	3.7	6.8L	170	68	1.5	130	57	27	130	460	430	1.0L	150L	120	31	15	1.5L	1,900	2.8 L	3.3	15	4.6L	5.6	160	20	99	10	750	150
Lee	Harlem	1244	10.5	46	24	0.76	0.93	0.22	2.6	19	1.0	0.40	1.2	0.20	600	550	35	0.50	250	110	140	9.5	80	22L	10L	6.1	40	15L	86	4.8	6.8L	120	150	1.2	270	110	15	96	140	190	1.0L	68L	380L	27	23	1.5L	1,500	1.7	3.8	20	4.6L	6.1	120	9.5	57	10	380	120
	Ames	1242	18.0	28	12	3.6	0.65	0.15	1.7	45	0.58	2.6	3.0	0.38	380	260	14	0.69	83	37	78	8.3	80	22L	10L	2.2	32	15L	42	2.2	6.8L	50	40	0.7	430	100	12	59	78	5.0L	1.0L	68L	220L	14	7.8	H	450	0.94	1.4	8.9	4.6L	7.5	110	12	49	5.6	290	120
Perry	Harlem	1241	11.6	62	25	0.60	1.4	0.22	3.4	4.4	1.2	0.09L	0.55	0.39	180	1,500	14	0.87	240	140	150	9.5	90	22L	10L	5.3	40	15L	140	6.0	6.8L	120	90	1.4	130	130	13	160	240	100	1.0L	72	340L	29	19	6.0	310	1.6	3.9	21	4.6L	9.1	160	9.5	74	11	310	120
Rose	Lower Kittanning (No. 5)	1246	9.7	40	23	4.2	0.51	0.28	1.4	26	1.3	0.10L	2.4	0.55	500	190	13	0.55	100	32	150	8.2	100	22L	10L	3.4	40	15L	29	6.2	6.8L	41	190	1.5	420	35	24	32L	80	51	1.0L	68L	410L	28	13	1.5L	380	2.1	3.7	23	4.6L	5.7	100	16	65	12	250	96
	Middle Kittanning (No. 6)	1233	9.8	32	19	1.5	0.60	0.26	1.5	37	0.92	0.10	1.9	0.55	300	1,900	10	0.98	110	16	91	6.1	70	22L	10L	2.4	42	15L	54	3.1	6.8L	51	150	0.5	260	16	13	63	60	17	1.0L	68L	410L	21	10	H	420	1.0	1.3	11	4.6L	12	89	5.1	32	6.1	260	72
		1236	5.3	41	30	2.4	0.73	0.34	1.7	16	1.4	0.19L	2.3	0.50	500	300	51	2.6	130	25	150	7.5	140	22L	10L	5.7	67	15L	68	5.7	6.8L	57	230	2.3	230	20	16	55	63	33	1.0L	68L	570L	37	19	5.7	530	1.9	4.3	19	4.6L	14	140	13	73	15	480	90
	Lower Freeport (No. 6A)	1234	10.1	35	21	1.3	0.58	0.22	1.4	37	0.75	0.10L	1.7	0.66	300	240	8.2	0.37	69	36	80	4.0	90	22L	10L	2.1	39	15L	20	3.0	6.8L	40	100	0.9	230	15	13	35	61	48	1.0L	68L	400L	21	7.9	H	440	0.89	1.3	9.9	4.6L	4.2	68	5.9	26	5.0	82	67
	Upper Freeport (No. 7)	1235	24.9	52	25	0.55	0.83	0.22	2.3	17	1.2	0.04L	1.1	0.33	310	330	7.8	0.61	120	30	160	9.6	110	22L	10L	3.3	34	15L	50	5.2	6.8L	56	240	1.0	330	20	14	44	69	41	1.0L	68L	240L	29	12	1.5L	300	1.6	2.8	18	4.6L	12	130	3.2	28	8.4	140	88
		1235-1	28.2	55	24	0.88	0.98	0.15	2.6	12	1.3	0.13	1.2	0.78	260	420	7.3	0.74	230	21	140	13	140	22L	10L	3.8	32	15L	14	5.7	6.8L	130	320	0.7	500	12	13	63	50	34	1.0L	68L	150	30	16	7.0	680	1.8	2.1	22	4.6L	15	130	2.8	21	6.7	120	78
COLUMBIANA COUNTY																																																													
Hanover	Upper Freeport (No. 7)	1377	10.1	28	16	1.6	0.45	0.26	1.4	47	0.63	0.36	1.4	0.48	320	260	17	0.68	120	29	90	5.9	170	22L	10L	3.6	34	15L	25	3.0	6.8L	59	81	0.7	130	110	15	52	110	64	1.2	68L	300L	19	7.9	H	610	3.0 L	1.8	17	4.6L	14	160	8.9	49	5.0	150	120
	Mahoning	1376	11.4	50	21	0.78	0.81	0.24	2.4	21	1.3	0.52	0.70	0.76	300	320	30	1.0	140	60	160	7.9	110	22L	10L	4.1	60	15L	140	5.3	6.8L	79	98	1.3	120	48	14	51	300	230	1.0L	150L	260L	32	11	1.5L	460	1.8	2.0	19	4.6L	9.9	130	17	42	8.8	1,100	87
COSHOCTON COUNTY																																																												
Adams	Lower Kittanning (No. 5)	1255	5.3	47	29	3.7	0.78	0.39	1.5	7.0	1.3	0.19L	3.8	0.22	460	340	56	1.2	130	41	180	5.7	62	46L	10L	6.8	70	15L	91	5.7	15 L	38	130	3.0	370	98	17	74	210	45	1.0L	68L	130	38	25	20	570	1.9	8.7	20	50	79	240	24	160	21	170	180
		1262	19.2	46	17	0.57	0.30	0.13	0.74	29	1.8	0.05L	1.2	0.37	380	92	16	1.2	99	24	100	2.6	110	22L	10L	2.3	38	15L	30	4.7	6.8L	47	170	1.0	190	37	14	32L	120	69	1.0L	68L	160L	23	8.9	1.5L	270	1.8	1.7	17	4.6L	12	86	7.3	36	7.8	190	120
	Middle Kittanning (No. 6)	1256	11.5	26	17	21	2.3	0.10	1.4	7.6	0.62	0.09L	19	0.59	99	2,000	20	0.74	130	23	110	5.2	99	46L	32L	7.1	59	15L	26	3.5	7.7	52	54	1.6	150	13	14	34	130	56	1.0L	68L	260L	36	21	1.5L	810	1.4	9.0	15	4.6L	10	110	5.2	150	14	130	180
		1263	14.3	47	20	0.91	0.56	0.23	1.5	26	1.1	0.07L	1.2	0.27	310	190	7.2	1.5	70	36	85	6.3	53	22L	10L	1.5	23	15L	29	2.8	6.8L	35	110	0.4	120	6.6	10	32L	120	23	1.0L	150L	280L	15	5.6	1.5L	320	1.3	1.3	10	4.6L	3.0	120	5.6L	25	4.2	120	150
Bedford		1167	3.7	29	19	3.6	0.25	0.42	0.68	39	0.87	0.27L	5.2	0.30	680	180	61	0.51	110	30	130	5.4	110	22L	10L	4.9	37	16	22	2.7	6.8L	54	150	1.6	450	78	22	93	84	18	1.0L	68L	810L	26	16	H	890	8.1 L	3.2	19	4.6L	21	170	16	120	11	160	240
Franklin		1159	7.2	30	19	1.6	0.55	0.30	1.1	45	0.75	0.14L	3.4	0.63	400	150	29	1.6	83	140	110	4.2	130	22L	10L	3.6	57	17	120	4.2	6.8L	42	200	1.4	220	130	19	67	240	26	1.0L	68L	560L	45	9.7	H	410	5.6 L	3.2	15	4.6L	40	210	5.6	100	8.3	1,200	200
Keene	Lower Kittanning (No. 5)	1161	12.7	38	20	1.3	0.55	0.23	1.6	35	1.1	0.14	2.2	0.83	390	580	13	0.92	120	49	140	6.3	120	46L	10L	4.1	51	15L	35	4.3	6.8L	260	220	1.9	210	55	16	200	250	64	1.0L	68L	390L	38	15	H	750	1.7	2.1	24	4.6L	23	180	5.5	91	8.7	170	260
	Middle Kittanning (No. 6)	1162	10.8	46	26	1.2	0.55	0.12	1.8	20	1.7	0.09L	2.2	0.57	250	470	22	0.39	130	15	200	5.6	160	22L	10L	3.7	55	15L	63	8.3	6.8L	74	250	2.0	310	130	33	79	100	37	1.0L	150L	370L	45	12	1.5L	570	2.2	3.0	28	4.6L	38	240	5.6	94	12	80	220
		1187	2.3	32	25	3.5	0.76	0.82	0.71	29	1.2	0.43L	5.0	0.57	460	190	90	2.9	300	52	190	13 L	180	22L	10L	7.8	48	46L	110	8.7	15 L	87	290	3.0L	320	81	15	100	92	25	1.0L	68L	1,300L	50	35	1.5L	830	13 L	7.0	22	4.6L	11 L	120	35	170	22	660	180
Lafayette	Lower Kittanning (No. 5)	1259	6.7	35	23	2.0	0.32	0.44	0.41	30	1.1	1.1	2.3	0.92	450	250	37	0.72	180	66	170	1.5	190	46L	32L	4.9	93	15L	H	6.0	11	90	200	3.1	220	46	23	110	450	86	1.0L	68L	450L	73	19	1.5L	2,700	1.3	6.3	22	4.6L	12	280	22	130	22	180	370
	Middle Kittanning (No. 6)	1160	3.1	20	17	3.7	0.55	0.69	0.37	49	0.84	0.32L	6.0	0.95	460	270	77	1.3	160	39	77	9.7L	160	22L	10L	5.2	73	16	74	3.2	6.8L	65	97	1.3L	410	6.8L	19	60	110	16	1.0L	68L	1,300L	27	19	H	2,000	6.5 L	4.2	13	4.6L	24	120	19	110	13	440	140
Oxford	Lower Kittanning (No. 5)	1257	6.3	34	20	1.9	0.48	0.47	0.82	34	0.92	0.16L	2.7	0.76	350	150	45	3.0	110	150	140	6.3	130	22L	10L	4.3	57	15L	H	3.2	6.8L	48	97	1.7	200	210	33	89	640	37	1.0L	68L	630L	31	14	H	380	1.1	5.4	14	4.6L	33	260	13	160	11	470	290
		1261	6.0	31	20	2.5	0.55	0.40	0.66	35	0.72	0.17L	3.1	0.45	300	250	34	1.1	250	87	120	3.3	110	46L	32L	8.5	42	18	57	3.3	16	130	160	4.5	210	53	13	140	290	34	1.0L	68L	500L	37	30	H	1,600	1.3	12	15	4.6L	20	160	15	200	35	150	140
	Middle Kittanning (No. 6)	1260	3.2	22	18	3.9	0.78	0.67	0.86	41	0.89	0.31L	3.5	0.42	320	480	35	0.80	130	34	180	3.1	110	22L	10L	3.8	34	15L	31	3.1	6.8L	63	120	1.9	810	55	22	32L	83	29	1.0L	68L	940L	26	13	H	840	1.3	4.4	19	4.6L	8.4L	140	13	140	13	200	220
GALLIA COUNTY																																																											
Clay	Pittsburgh (No. 8)	1146	8.3	30	20	1.6	0.53	0.22	1.3	39	0.70	0.06L	1.1	0.20	500	190	14	0.84	110	37	110	8.4	46	22L	10L	2.5	23	15L	110	2.4	6.8L	48	87	1.1	230	44	14	44	76	45	1.0L	68L	240L	21	12	1.5L	380	12 L	4.8 L	12	47	3.7L	110	12	49	7.2	210	120
		1147	9.6	41	21	1.1	0.65	0.18	1.7	28	0.99	0.13	0.42	0.28	460	390	6.7	0.92	100	22	100	10	64	22L	10L	1.9	22	15L	3.3	5.2	6.8L	63	94	0.7	160	3.2	11	48	54	20	1.0L	150L	110	22	10	1.5L	600	8.3 L	2.4	18	4.6L	3.3L	90	3.1	28	5.2	110	110
		1147-1	25.2	51	22	0.64	0.73	0.18	2.2	18	1.2	0.08	0.02L	0.14	220	370	4.5	0.80	120	26	120	8.7	76	22L	10L	2.7	21	15L	1.9	6.3	6.8L	67	120	0.8	100	5.2	19	60	57	26	1.0L	68L	71	24	11	1.5L	370	7.9 L	1.7	19	4.6L	5.9	120	2.0	35	4.8	140	220
		1147-2	15.4	47	23	1.4	0.65	0.19	2.3	21	1.0	0.83	0.07	0.14	350	650	14	1.1	140	35	130	9.1	52	22L	10L	2.4	28	15L	23	5.8	6.8L	84	85	0.9	170	7.8	26	120	64	25	1.0L	150L	110	24	12	1.5L	1,100	5.8 L	2.0	16	4.6L	2.9	130	3.9	50	5.8	160	230
Harrison		1140	10.7	34	17	1.4	0.60	0.15	1.4	39	0.77	0.47	1.4	0.26	500	620	17	1.4	100	68	120	7.5	46	22L	10L	2.7	36	15L	82	3.7	6.8L	56	80	1.2	270	51	30	71	130	18	1.0L	68L	190L	24	14	H	440	8.4 L	4.6	11	4.6L	7.1	160	9.3	87	7.5	210	350
		1140-1	35.1	55	23	0.48	0.93	0.19	2.6	13	1.0	0.01L	0.02L	0.10	150	300	7.4	0.55	110	27	110	8.8	48	22L	10L	2.0	25	15L	25	6.8	6.8L	60	140	0.8	200	1.0L	11	32	60	36	1.0L	68L	120	21	10	1.5L	240	5.7 L	1.5	18	4.6L	5.9	100	2.0	23	4.8	150	94
	Redstone (No. 8A)	1141	10.7	32	20	1.8	0.41	0.20	1.1	38	0.72	0.34	0.82	0.30	300	370	25	0.75	100	38	120	6.5	47	22L	10L	4.7L	42	15L	140	2.8	6.8L	47	120	1.3	150	59	24	61	110	37	1.0L	68L	190L	27	11	H	590	9.3 L	4.7 L	15	4.6L	11	140	9.3	77	8.4	340	230
Walnut	Middle Kittanning (No. 6)	1139	6.6	31	25	1.7	0.41	0.18	0.76	36	0.82	0.08L	1.3	0.46	700	170	45	0.65	120	71	170	6.1	180	22L	10L	4.4	41	15L	70	4.5	6.8L	61	170	1.7	120	58	14	61	120	140	1.0L	68L	300L	38	17	1.5L	340	14 L	4.7	17	55	13	160	6.1	91	11	120	140
GUERNSEY COUNTY																																																										
Jackson	Upper Freeport (No. 7)	1163	8.6	40	24	1.1	0.46	0.19	1.4	31	1.3	0.12L	1.7	0.54	400	180	26	0.68	140	55	170	7.0	130	22L	10L	2.7	43	15L	68	5.8	6.8L	70	170	1.2	72	47	21	62	140	110	1.0L	150L	470L	33	12	H	300	1.9	2.0	23	4.6L	12	120	5.8	34	7.0	140	110
	Anderson	1164	17.7	38	18	1.4	0.83	0.22	2.0	35	0.80	0.06L	2.9	0.15	350	330	25	0.58	100	29	90	7.9	50	22L	10L	2.3	37	15L	73	3.4	6.8L	51	110	0.8	260	110	20	65	93	39	1.0L	150L	170	23	8.5	H	350	1.6	1.1	13	4.6L	26	120	6.2	60	5.6	150	200
Londonderry	Pittsburgh (No. 8)	1165	14.9	30	16	2.7	0.41	0.16	1.1	47	0.55	0.07L	3.2	0.45	250	420	11	0.96	87	79	68	6.0	310	22L	10L	3.4	34	15L	44	3.4	6.8L	40	74	1.0	370	6.8L	16	32L	140	10 L	1.0L	68L	340L	13	11	H	720	2.7 L	2.4	8.7	4.6L	13	79	2.7	47	5.4	400	91
Washington	Anderson	1166	6.5	28	16	1.5	0.33	0.22	0.71	51	0.82	0.15l	2.1	0.53	200	160	48	0.52	92	29	91	4.6L	67	46L	10L	3.7	39	18	63	4.6	6.8L	46	70	1.2	130	15	27	60	98	80	1.0L	68L	460L	24	11	H	470	4.6 L	2.6	14	4.6L	27	120	11	110	9.2	110	270
HARRISON COUNTY																																																										
Archer	Pittsburgh (No. 8)	1363	11.1	43	19	0.74	0.53	0.28	1.4	30	0.95	0.28	0.98	0.22	550	210	7.7	1.2	100	37	120	9.9	69	22L	10L	2.5	22	15L	18	4.1	6.8L	54	100	0.6	150	6.8L	20	39	110	24	1.0L	68L	72	22	7.2	1.5L	410	1.9	1.5	16	4.6L	4.3	110	3.6	28	4.1	140	160
		1371	11.6	40	17	9.2	0.61	0.26	1.6	21	0.84	0.34	4.0	0.10L	380	340	16	0.72	86	26	140	6.9	51	22L	10L	2.1	29	15L	55	3.4	6.8L	34	69	0.5	370	5.9	19	32L	61	12	1.0L	68L	260L	18	5.2	1.5L	420	0.95	1.7	11	4.6L	6.9	120	4.3	38	4.3	110	190
	Redstone (No. 8A)	1364	28.6	51	20	0.64	1.2	0.40	2.4	20	0.84	0.28	1.5	0.10L	210	380	9.8	0.84	110	57	100	9.6	76	22L	10L	2.7	24	15L	26	3.8	6.8L	59	100	0.6	1,600	3.0	15	46	110	51	1.0L	68L	91	20	8.9	1.5L	290	1.2	1.3	15	4.6L	6.1	110	3.3	39	4.2	230	200
		1365	11.3	25	9	3.1	1.2	0.27	1.1	31	0.77	0.31	1.3	0.76	600	340	49	0.90	83	28	130	6.2	62	22L	10L	2.8	35	15L	84	5.3	6.8L	53	130	1.1	330	10	31	78	94	37	1.0L	68L	350L	24	8.0	1.5L	460	3.3	2.6	18	4.6L	6.8	160	2.3	63	8.0	190	250
German	Pittsburgh (No. 8)	1373	11.3	49	21	0.92	0.65	0.26	1.8	2.4	0.97	0.32	1.4	0.19	400	290	11	0.92	120	21	140	8.8	59	22L	10L	2.5	24	15L	37	4.4	6.8L	53	81	0.4	140	14	19	32L	56	21	1.0L	150L	88	22	7.1	1.5L	320	1.5	1.2	16	4.6L	6.9	110	3.5	29	4.4	130	160
	Redstone (No. 8A)	1366	14.9	50	19	1.7	0.85	0.30	2.2	21	0.92	0.32	1.4	0.16	400	310	27	0.59	60	22	120	8.7	44	22L	10L	1.9	32	15L	86	5.4	6.8L	34	76	0.8	170	6.4	11	43	95	32	1.0L	150L	270L	19	6.0	4.3	320	0.47	1.8	14	4.6L	6.0	110	10	38	6.0	97	100
Washington	Upper Freeport (No. 7)	1174	8.1	41	20	1.1	0.56	0.20	2.0	34	0.92	0.12L	1.3	0.49	500	450	39	0.96	120	83	98	6.2	80	22L	12	2.8	40	16	40	3.7	6.8L	74	84	1.4	70	140	26	94	240	160	1.0L	68L	370L	22	11	H	430	3.7 L	2.8	16	4.6L	5.1	120	11	120	8.6	430	240
HOCKING COUNTY																																																										
Starr	Lower Freeport (No. 6A)	1375	10.6	39	23	1.1	0.53	0.20	1.5	31	0.80	0.41	1.5	0.45	450	200	26	1.4	94	91	160	4.7	110	22L	10L	3.4	35	15L	57	3.8	6.8L	47	210	0.9	1,300	78	12	45	180	31	1.0L	68L	94	27	11	1.5L	430	2.0	2.5	16	4.6L	11	150	11	53	8.5	99	93
Ward	Upper Freeport (No. 7)	1151	10.7	29	13	0.94	0.25	0.01L	0.60	55	0.94	0.09L	1.1	0.72	460	94	21	0.57	84	74	120	3.7	87	22L	10L	2.3	41	15L	7.7	3.7	6.8L	37	60	0.9	120	6.8L	18	32L	130	32	1.0L	150L	370L	24	7.5	H	290	3.7 L	1.3	17	4.6L	14	110	4.7	36	5.6	79	100
Washington	Clarion (No. 4A)	1150	4.3	38	29	3.2	0.50	0.55	0.70	19	0.89	0.23L	4.8	0.50	460	150	91	2.6	120	72	150	4.7	150	22L	10L	4.0	22L	15L	500	4.7	15 L	47	230	0.9L	200	51	16	47	440	68	1.0L	68L	1,200L	46	16	15	800	7.0 L	2.8	19	4.6L	16	200	30	72	9.3	320	120
HOLMES COUNTY																																																										
Berlin	Lower Kittanning (No. 5)	1212	7.4	40	19	1.6	0.58	0.38	1.1	31	1.2	0.14L	2.1	0.38	220	330	21	1.3	110	46	130	5.4	120

TABLE 6.—*Major and minor oxide and trace element composition of the laboratory ash, by bed*

Key to symbols:
Method (column heads):
E - by emission spectrography on ash
NA - by neutron activation on whole coal
WA - by wet chemistry on ash
XA - by X-ray fluorescence on ash
XW - by X-ray fluorescence on whole coal
H - not determined due to interference
L - less than value shown
N - not detected

Analyses were performed by the U.S. Geological Survey. The coals were ashed at 525°C for major, minor, and trace element analysis. These values may not agree exactly with ash values in standard proximate analysis. The analytical program of the U.S. Geological Survey is periodically revised and improved. The values reported represent the best data available at the time of manuscript preparation. Those determinations made by wet chemistry are quantitative; the remaining methods are considered semiquantitative. "The precision and accuracy of the computer spectrographic values (E) are within one bracket at 68% confidence level and two brackets at 95% confidence level. The bracket is logarithmically defined as +50%, -33% of value reported" (U.S. Geological Survey, written commun., 1979). Ash figure is percentage of total coal; SO_3 figure only shows sulfur retained by the sample on ashing. Values for S in the whole coal should be taken from the proximate-ultimate analyses (tables 1 and 2).

The following elements were looked for by emission spectrographic analysis of the ash and were not found: Au, Bi, In, Ir, Os, Pt, Re, Rh, Ru, Te, Tm.

County	Township	DGS file no.	Ash %	SiO_2 % XA	Al_2O_3 % XA	CaO % XA	MgO % WA	Na_2O % WA	K_2O % XA	Fe_2O_3 % XA	TiO_2 % XA	P_2O_5 % XW	SO_3 % XA	Ag ppm E	B ppm E	Ba ppm E	Be ppm E	Cd ppm WA	Ce ppm NA	Co ppm NA	Cr ppm NA	Cs ppm NA	Cu ppm WA	Dy ppm E	Er ppm E	Eu ppm NA	Ga ppm E	Gd ppm E	Ge ppm E	Hf ppm NA	Ho ppm E	La ppm NA	Li ppm WA	Lu ppm NA	Mn ppm WA	Mo ppm E	Nb ppm E	Nd ppm E	Ni ppm E	Pb ppm WA	Pd ppm E	Pr ppm E	Rb ppm NA	Sc ppm NA	Sm ppm NA	Sn ppm E	Sr ppm E	Ta ppm NA	Tb ppm NA	Th ppm NA	Tl ppm NA	U ppm NA	V ppm E	W ppm NA	Y ppm E	Yb ppm NA	Zn ppm WA	Zr ppm E
SHARON (NO. 1) COAL																																																									
Jackson	Liberty	1134	13.9	44	34	1.6	0.90	0.20	2.1	8.5	0.92	0.69	0.90	1.6	1,000	840	21	2.5	320	170	140	10	380	46L	10L	6.0	38	15L	35	4.3	6.8L	260	220	1.9	210	55	16	200	250	64	1.0L	68L	220L	29	26	3.8	1,800	14 L	4.4	18	4.6L	7.2	240	10	110	12	750	130
		1135	21.7	49	37	0.62	0.96	0.18	2.5	3.8	1.3	0.02L	0.02L	0.18	680	510	14	0.35	170	55	130	6.0	110	22L	10L	2.4	43	15L	24	4.6	6.8L	92	400	0.9	180	3.9	26	130	160	64	1.0L	68L	92L	26	14	8.5	540	4.6 L	2.1	16	4.6L	7.6	280	9.2	61	6.5	120	180
Pike	Marion	1136	14.1	48	40	0.80	0.70	0.13	1.5	3.3	1.6	0.15	0.02L	0.51	800	300	24	0.35	350	140	300	23	130	22L	10L	5.3	55	15L	56	11	6.8L	220	400	2.1	53	9.1	19	110	200	70	1.0L	68L	160	55	33	8.5	310	14 L	3.5	41	4.6L	16	220	11	72	13	140	150
QUAKERTOWN (NO. 2) COAL																																																											
Licking	Bowling Green	1253	11.9	51	30	0.57	0.73	0.13	2.1	10	1.4	0.08L	1.1	0.53	220	260	26	0.54	240	82	180	13	130	22L	10L	4.5	54	15L	83	5.9	6.8L	130	250	1.1	95	16	16	77	240	72	1.0L	68L	120	38	16	1.5L	660	2.4	2.7	24	4.6L	8.5	190	12	58	9.2	100	170
BEAR RUN COAL																																																										
Licking	Bowling Green	1254	29.3	67	21	0.41	0.27	0.08	0.88	7.6	2.4	0.03L	0.82	0.10L	180	120	20	0.19	110	10	170	2.0	140	22L	10L	2.3	18	15L	6.0	12	6.8L	56	120	1.2	68	8.1	38	32L	50	100	1.0L	68L	55	32	9.7	2.8	190	4.0	3.4	41	4.6L	21	120	4.3	50	7.8	17	430
LOWER MERCER (NO. 3) COAL																																																										
Stark	Sugar Creek	1217	8.2	45	34	1.1	0.48	0.18	1.3	16	1.1	0.12L	0.98	2.0	350	230	20	0.79	480	130	180	6.1	180	22L	10L	7.9	55	15L	52	6.1	6.8L	230	170	2.4	87	28	9	90	220	130	1.0L	68L	370L	61	45	1.5L	500	0.85	4.8	35	4.6L	7.9	200	9.8	48	15	170	69
		1217-1	38.9	56	29	0.34	1.2	0.16	3.3	7.1	1.3	0.03	0.95	0.21	270	520	8.9	0.64	180	28	150	14	190	22L	10L	2.5	32	15L	29	6.9	6.8L	95	190	1.1	170	8.7	22	52	92	56	1.0L	68L	220	36	15	4.3	370	1.4	1.6	24	4.6L	10	220	2.8	27	6.7	190	150
BEDFORD COAL																																																										
Stark	Sugar Creek	1218	28.3	41	32	0.35	0.68	0.16	2.8	20	1.1	0.04L	0.82	0.29	360	310	14	2.8	220	270	130	8.5	270	22L	10L	4.6	45	15L	36	4.9	6.8L	120	180	1.7	48	17	11	66	220	120	1.0L	68L	220	33	23	1.5L	190	1.1	3.5	25	4.6L	13	190	3.5	64	9.9	850	79
TIONESTA (NO. 3B) COAL																																																										
Stark	Bethlehem	1238	14.8	31	17	0.55	0.58	0.16	1.7	45	0.78	0.07L	1.2	0.94	250	190	11	0.64	100	83	87	6.1	100	22L	10L	2.4	38	15L	19	3.4	6.8L	47	70	0.8	140	8.0	8	32L	130	130	1.0L	68L	270L	22	8.8	H	300	0.95	1.3	14	4.6L	7.2	96	3.4	28	6.1	130	61
	Sugar Creek	1219	32.2	24	19	3.2	0.25	0.08	0.85	45	0.53	0.11	3.8	0.12	260	160	13	3.8	310	210	120	3.4	84	22L	10L	6.5	31	15L	29	3.7	6.8L	120	110	1.9	1,300	6.3	9	84	110	7.0	1.0L	68L	120L	33	29	1.5L	440	0.59	4.0	9.0	4.6L	7.0	87	2.5L	48	11	740	71
Tuscarawas	Sugar Creek	1201	7.3	36	24	2.0	0.51	0.35	1.0	29	0.92	0.15	2.5	0.50	680	180	27	0.68	370	82	190	4.1	130	22L	10L	5.9	42	15L	19	5.5	6.8L	220	240	1.4L	170	31	7	100	96	44	1.0L	68L	550L	37	33	1.5L	1,300	5.5 L	4.2	21	4.6L	17	180	8.2	49	11	150	70
		1201-1	16.7	46	21	0.77	0.81	0.16	2.8	23	1.1	0.20	1.2	0.12	500	380	11	0.39	180	14	100	12	68	22L	10L	2.1	37	15L	23	5.4	6.8L	100	140	1.2L	220	46	14	100	57	68	1.0L	68L	370L	22	10	1.5L	1,500	1.4	0.90	19	4.6L	19	170	7.2	32	4.2	110	110
		1227	8.2	22	18	2.2	0.35	0.31	0.49	51	0.45	0.21	2.0	0.55	350	160	17	1.9	220	83	100	2.4	110	22L	10L	4.1	35	20	13	2.4	6.8L	110	110	1.6	140	7.6	9	70	65	5.0L	1.0L	140	370L	22	23	H	1,100	0.73	2.4	12	4.6L	3.2L	76	2.4	48	8.5	75	53
		1227-1	13.1	32	19	0.92	0.75	0.22	2.3	40	0.82	0.08L	1.6	0.31	220	170	9.1	1.6	99	18	82	11	100	22L	10L	2.7	27	15L	6.9	3.8	6.8L	61	89	0.8	120	48	17	32L	47	23	1.0L	68L	170	18	11	H	510	0.99	1.4	14	4.6L	7.2	100	6.1	31	4.6	130	110
Wayne	Paint	1243	6.7	42	36	1.3	0.35	0.14	0.71	17	0.72	0.15L	1.1	1.1	300	330	57	0.56	310	220	140	3.0	200	22L	10L	6.3	58	15L	38	6.0	6.8L	160	230	1.8	240	6.4	7	150	370	100	1.0L	68L	450L	58	27	1.5L	610	1.2	4.0	28	4.6L	6.6	190	7.5	63	15	350	54
		1243-1	20.7	51	28	0.59	1.0	0.15	2.6	9.9	1.0	0.31	0.85	0.31	260	480	10	0.38	350	100	160	12	100	22L	10L	5.0	53	15L	15	5.3	6.8L	200	120	1.4	70	4.4	14	140	130	55	1.0L	68L	240L	43	21	3.8	1,800	1.8	3.2	24	4.6L	8.3	180	2.9	47	11	450	82
BROOKVILLE (NO. 4) COAL																																																										
Holmes	Clark	1214	11.4	46	28	1.8	0.73	0.27	1.6	14	1.7	0.17	1.7	4.7	200	2,300	61	11	290	130	330	7.0	530	51	28	8.5	85	95	220	9.6	6.8L	130	130	3.6	230	68	22	130	400	100	1.0L	68L	260L	110	42	1.5L	1,700	2.7	7.3	39	4.6L	79	660	13	120	21	480	230
	Hardy	1231	6.9	41	32	3.1	0.48	0.44	0.70	16	0.92	0.14L	2.4	0.68	400	1,500	46	2.5	100	96	260	2.9	150	22L	10L	5.5	180	15L	250	5.8	6.8L	29	130	0.9	280	75	17	96	430	100	1.0L	68L	430L	58	25	52	690	2.0	4.1	26	4.6L	48	230	7.2	63	8.7	270	110
		1239	7.6	45	32	3.9	0.68	0.38	1.1	9.9	1.4	0.13L	3.8	0.95	1,000	1,800	53	1.9	110	61	230	5.3	120	22L	10L	4.3	270	15L	320	6.6	6.8L	39	150	1.1	150	72	16	67	260	93	1.0L	68L	530L	47	20	71	740	2.2	2.6	24	4.6L	73	260	11	76	9.2	220	160
	Salt Creek	1215	9.8	45	28	1.9	0.75	0.30	1.7	17	1.2	0.10L	2.3	0.57	280	470	47	4.5	130	73	230	10	140	22L	10L	3.8	71	30	79	7.1	6.8L	51	120	0.5L	170	26	24	69	120	36	1.0L	68L	71	310L	44	24	1.5L	490	1.2	2.8	24	4.6L	82	240	5.1	50	9.2	430	150
Stark	Bethlehem	1237	8.3	36	24	2.7	0.75	0.28	1.5	28	1.0	0.13	3.4	0.75	300	550	16	5.4	140	36	220	7.2	130	22L	10L	4.1	110	17	130	4.8	6.8L	72	130	1.1	200	39	17	65	78	40	1.0L	68L	480L	49	16	14	1,900	1.4	2.8	22	4.6L	63	180	6.0	45	8.4	260	120
	Sugar Creek	1220	4.3	18	13	5.1	0.78	0.66	0.62	54	0.45	0.23L	3.9	0.58	600	610	61	2.3	140	40	160	2.3	110	43	21	8.1	91	20	150	4.7	6.8L	47	54	0.2L	310	170	11	32L	73	17	1.0L	68L	470L	62	N	H	650	2.1 L	7.2	14	4.6L	110	110	12 L	130	4.7L	300	77
		1220-1	16.5	38	35	0.66	0.23	0.15	0.44	24	0.63	0.06L	0.70	0.63	180	200	23	0.93	150	110	360	3.0	210	34	19	6.3	61	15L	73	6.7	6.8L	48	260	3.0	120	41	7	32L	170	24	1.0L	68L	180L	76	23	1.5L	440	0.97	6.8	30	4.6L	15	220	1.8	96	20	190	160
Tuscarawas	Dover	1130	14.0	46	22	5.1	0.85	0.32	1.8	14	1.2	0.04L	3.3	0.51	680	280	24	4.2	140	67	220	5.7	110	46L	16	2.9	90	15L	140	6.8	6.8L	50	120	1.4	300	32	19	61	250	78	1.0L	68L	64	62	16	4.6	340	14 L	2.1	22	4.6L	94	230	5.0	65	10	580	180
	Sugar Creek	1200	10.7	47	23	3.1	1.1	0.22	2.4	15	1.1	0.09L	4.8	1.0	600	530	55	6.8	250	110	270	5.6	150	22L	10L	3.7	240	15L	410	6.5	6.8L	75	170	0.9L	170	98	28	120	710	190	1.0L	150L	280	100	26	1.5L	600	4.7 L	2.1	31	4.6L	320	780	12	80	6.5	420	230
		1226	7.2	31	19	11	0.93	0.31	0.74	3.4	0.37	0.14L	15	0.50	380	690	67	4.1	290	140	190	5.6L	120	35	28	6.3	170	23	300	4.2	10	83	89	0.1L	130	75	13	110	450	98	1.0L	68L	280L	170	N	1.5L	640	2.8 L	4.2	24	4.6L	230	200	9.7L	110	2.8L	180	170
	Wayne	1192	13.6	45	22	4.8	0.83	0.26	2.0	18	1.1	0.07L	4.5	0.26	320	350	28	1.6	88	51	160	5.9	120	22L	10L	2.0	45	15L	98	5.9	6.8L	37	120	1.5L	270	81	22	56	250	64	1.0L	68L	290L	63	8.8	1.5L	300	1.5	0.66	22	4.6L	92	150	10	45	4.4	180	200
Vinton	Richland	1145	6.9	26	20	2.3	0.63	0.06	0.52	43	0.42	0.07L	2.5	0.50	700	200	54	0.70	140	86	84	4.3L	130	46L	10L	3.8	29	15L	22	5.8L	6.8L	72	120	1.4	110	62	16	95	130	45	1.0L	68L	290L	21	14	H	430	13 L	4.1	12	4.6L	4.8L	130	4.3	100	8.7	220	160
		1145-1	17.8	62	23	1.7	1.3	0.08	0.98	5.6	1.4	0.03L	0.63	0.11	310	230	9.6	0.24	110	19	130	3.9	130	22L	10L	2.1	21	15L	14	6.2	6.8L	62	110	0.8	79	3.6	10	32L	47	33	1.0L	68L	110L	30	10	2.6	250	11.2 L	2.5	26	4.6L	12	110	2.2	29	5.1	88	160
Wayne	Salt Creek	1224	9.9	43	27	1.3	0.65	0.38	1.5	22	1.3	0.10L	1.3	0.40	350	260	16	1.1	150	79	170	10	100	22L	10L	5.2	51	15L	60	7.1	6.8L	61	160	1.9	130	33	21	49	100	29	1.0L	68L	91	34	26	11	420	1.7	3.3	21	4.6L	45	130	7.1	67	10	190	130
CLARION (NO. 4A) COAL																																																									
Hocking	Washington	1150	4.3	38	29	3.2	0.50	0.55	0.70	19	0.89	0.23L	4.8	0.50	460	150	91	2.6	120	72	150	4.7	150	22L	10L	4.0	22L	15L	500	4.7	15 L	47	230	0.9L	200	51	16	47	440	68	1.0L	68L	1,200L	46	16	15	800	7.0 L	2.8	19	4.6L	16	200	30	72	9.3	320	120
Jackson	Milton	1148	6.1	32	26	3.3	0.61	0.16	0.84	28	0.77	0.33	3.3	0.43	1,200	260	56	1.8	230	72	170	6.6	110	22L	10L	4.8	35	15L	13	4.9	6.8L	110	120	1.6	240	7.4	7	110	90	19	1.0L	68L	330L	33	31	1.8	1,400	15 L	7.4	18	4.6L	5.2L	120	4.9	78	11	340	94
		1148-1	11.4	46	21	1.4	0.81	0.09	2.3	23	0.89	0.20	0.77	0.14	320	350	13	5.2	100	30	160	17	70	22L	10L	2.5	28	15L	16	4.4	6.8L	44	45	0.9	550	73	15	67	100	18	1.0L	68L	89	210	21	13	1.5L	480	1.3	1.6	14	4.6L	34	160	6.1	48	6.1	140	120
Lawrence	Washington	1131	7.8	30	19	2.0	0.55	0.12	1.1	39	0.78	0.06L	2.0	0.29	500	330	36	0.92	130	29	120	9.0	99	22L	10L	5.1	39	15L	55	5.1	6.8L	51	75	1.4	180	57	11	94	67	16	1.0L	68L	260L	25	21	H	530	12 L	5.3	13	4.6L	19	130	3.8	82	10	92	110
Vinton	Madison	1154	7.9	34	22	1.9	0.38	0.20	0.70	37	0.72	0.13L	2.5	0.56	460	180	19	0.84	110	47	190	5.1	90	22L	10L	3.4	58	15L	22	3.8	6.8L	76	210	1.1	110	6.8L	16	73	110	21	1.0L	68L	630L	38	14	H	720	5.1 L	2.5	19	4.6L	18	240	6.3	70	7.6	170	140
		1154-1	20.9	52	29	1.2	0.27	0.09	0.79	13	1.6	0.74	1.6	0.22	390	330	29	1.0	360	120	220	2.4	110	22L	10L	4.1	63	15L	59	8.1	6.8L	230	300	1.4	29	11	36	120	170	64	1.0L	68L	290L	46	19	8.2	1,700	2.2	3.4	36	4.6L	11	160	1.9	64	9.1	180	220
	Swan	1149	9.0	37	24	1.9	0.41	0.15	0.84	30	0.72	1.5	3.2	0.81	560	310	16	1.4	380	100	180	5.6	110	46L	10L	5.1	32	15L	4.0	5.6	6.8L	220	190	1.1	110	6.8L	18	210	140	26	1.0L	150L	560L	37	27	H	2,300	4.4 L	2.9	26	4.6L	14	190	5.6	81	7.8	130	160
SCRUBGRASS COAL																																																									
Vinton	Madison	1155	16.3	46	16	1.1	0.91	0.11	2.5	30	0.90	0.06L	2.6	0.31	400	340	42	0.41	86	19	87	16	46	22L	10L	2.1	37	15L	50	5.5	6.8L	43	41	1.0	160	73	36	77	76	26	1.0L	68L	120	22	8.6	H	410	1.1	1.2	17	4.6L	13	130	6.1	72	6.1	130	190
LOWER KITTANNING (NO. 5) COAL																																																								
Carroll	Rose	1246	9.7	40	23	4.2	0.51	0.28	1.4	26	1.3	0.10L	2.4	0.55	500	190	13	0.55	100	32	150	8.2	100	22L	10L	3.4	40	15L	29	6.2	6.8L	41	190	1.5	420	35	24	32L	80	51	1.0L	68L	410L	28	13	1.5L	380	2.1	3.7	23	4.6L	5.7	100	16	65	12	250	96
Coshocton	Adams	1255	5.3	47	29	3.7	0.78	0.39	1.5	7.0	1.3	0.19L	3.8	0.22	460	340	56	1.2	130	41	180	5.7	62	46L	10L	6.8	70	15L	91	5.7	15 L	38	130	3.0	370	98	17	74	210	45	1.0L	68L	410L	138	38	25	20	570	1.9	8.7	20	50	79	240	24	160	21	170	180
		1262	19.2	46	17	0.57	0.30	0.13	0.74	29	1.8	0.05L	1.2	0.37	380	92	16	1.2	99	24	100	2.6	110	22L	10L	2.3	38	15L	30	4.7	6.8L	47	170	1.0	190	37	14	32L	120	69	1.0L	68L	160L	23	8.9	1.5L	270	1.8	1.7	17	4.6L	12	86	7.3	36	7.8	190	120
	Keene	1161	12.7	38	20	1.3	0.55	0.23	1.6	35	1.1	0.14	2.2	0.83	390	580	13	0.92	120	49	140	6.3	120	46L	10L	4.1	51	19	55	6.3	6.8L	63	150	1.3	290	110	30	120	170	55	1.0L	68L	390L	38	15	H	750	1.7	2.1	24	4.6L	23	180	5.5	91	8.7	170	260
	Lafayette	1259	6.7	35	23	2.0	0.32	0.44	0.41	30	1.1	1.1	2.3	0.92	450	250	37	0.72	180	66	170	1.5	190	46L	32L	4.9	93	15L	H	6.0	11	90	200	3.1	220	46	23	110	450	86	1.0L	68L	450L	73	19	1.5L	2,700	1.3	6.3	22	4.6L	12	280	22	130	22	180	370
	Oxford	1257	6.3	34	20	1.9	0.48	0.47	0.82	34	0.92	0.16L	2.7	0.76	350	150	45	3.0	110	150	140	6.3	130	22L	10L	4.3	57	15L	H	3.2	6.8L	48	97	1.7	200	210	33	89	640	150	1.0L	68L	630L	31	14	H	380	1.1	5.4	14	4.6L	33	260	13	160	11	470	290
		1261	6.0	31	20	2.5	0.55	0.40	0.66	35	0.72	0.17L	3.1	0.45	300	250	34	1.3	110	47	120	3.3	110	46L	32L	8.5	42	18	57	3.3	16	130	160	4.5	210	53	13	140	290	34	1.0L	68L	500L	37	30	H	1,600	1.3	12	15	4.6L	20	160	15	200	35	150	140
Holmes	Berlin	1212	7.4	40	19	1.6	0.58	0.38	1.1	31	1.2	0.14L	2.1	0.38	220	330	21	1.3	110	46	130	3.4	120	22L	10L	3.9	32	15L	43	5.4	6.8L	54	83	1.9	180	72	14	50	170	20	1.0L	68L	410L	26	18	H	400	1.4	4.1	19	4.6L	6.4	100	12	75	12	320	140
		1216	5.2	36	27	0.29	0.43	0.73	0.78	36	0.52	0.19L	0.88	0.63	280	160	37	1.4	120	88	92	3.8	130	29	10L	4.6	38	63	68	3.5L	6.8L	38	27	2.5	250	89	15	32L	98	5.0L	1.0L	68L	580L	16	15	H	820	1.9 L	3.8	7.7	4.6L	6.9	68	23	110	13	290	190
	Hardy	1232	9.8	26	16	1.7	0.40	0.34	0.90	49	0.53	0.10L	2.0	0.55	250	260	15	2.8	100	83	110	3.6	90	22L	10L	4.5	92	15L	61	3.1	6.8L	31	50	1.9	470	38	15	120	180	19	1.0L	68L	510L	62	17	H	570	2.0 L	4.4	14	4.6L	25	100	11	61	17	450	65
		1232-1	54.5	62	23	0.49	0.91	0.15	2.8	6.0	2.0	0.04	1.0	0.15	216	570	6.8	0.97	140	33	120	13	69	22L	10L	2.6	41	15L	6.6	8.1	6.8L	68	198	0.6	80	40	15	43	140	61	1.0L	68L	96	23	11	7.6	520	2.9	1.5	21	4.6L	18	120	3.3	36	6.6	320	340
	Paint	1223	7.0	46	24	2.3	0.68	0.15	1.2	20	1.2	0.49	1.7	0.65	320	280	51	2.1	190	76	150	4.3	170	22L	10L	4.4	57	40	240	5.7	6.8L	86	98	2.6	420	37	17	94